

THE
VEGETABLE SYSTEM.

OR,
The INTERNAL STRUCTURE,
AND
The LIFE of PLANTS,
Their PARTS and NOURISHMENT Explained;

THEIR
CLASSES, ORDERS, GENERA, and SPECIES,
Ascertained and Described;

In a METHOD altogether NEW.

COMPREHENDING
AN ARTIFICIAL INDEX,

AND
A NATURAL SYSTEM.

With FIGURES of all the PLANTS; Designed and Engraved by the AUTHOR.

The WHOLE from NATURE only.

BY JOHN HILL, M. D.

VOL. II. PART I.

Containing the WHOLE SERIES of PLANTS with RADIATED FLOWERS.

L O N D O N:

Printed at the EXPENCE of the AUTHOR,

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MANUFACTURERS

OF

IRON

WORKS

AND

ENGINEERING



P R E F A C E.

IF care and attention demand some regard in works of Science, this may be allowed to plead at least that humbler kind of merit.

THE Reader will be pleased to know, that the Work now laid before him, has been printed and engraved more than a year; and has been kept so long unpublished, that truth and nature might appear in it, not only correctly represented from particular objects, but confirmed, ascertained, and universal. I claim no merit from this assiduity: I owe it all, and more, (if it were possible for me to have shewn more,) to the auspices under which this Work was begun, and to the patronage by which it is continued.

WHEN we compare Nature with the representations even of the most respected Authors, we see such differences as ought to give us a very humble opinion of the best human judgment. I hope many of their errors will be avoided here. They wrote often from the information of others: here every thing is from Nature only. The Plants themselves have furnished their own characters, not the accounts of those who had elsewhere seen them. They have been raised for this purpose in a garden where no manure has ever been admitted; and where there are no single Plants, but entire beds of each. They have been therefore raised in a state of simple nature; and, if any thing has appeared particular in one or two, it can have caused no error, since there were others of the kind wherewith to compare those variations.

I MAY

P R E F A C E.

I MAY be allowed therefore to hope the representations are to be depended on: and it will appear some advantage, that all the Plants of this extensive Class, are here shewn together; that there is no occasion to turn to other books about them; nor to lament the want of figures of any of them; without which even the most accurate descriptions often convey but very imperfect ideas of the object.

EACH figure represents such a portion of the Plant as contains all its characters: a flowering branch, with a larger leaf from the body of the stem, or root: and the size is that of apparent nature: not what the parts would measure if laid upon the paper, but such as they shew themselves naturally while growing. We bring a book within six or eight inches of the eye; but we view Herbs in their native beds, at ten, or twelve feet distance.

IN general, three or four Plants only are represented on a plate; but where the species are numerous, and the distinctions could not be comprehended but by a view of several of them at once, I have been content to take smaller portions, and to reduce the usual size a little, that six or eight may stand before the eye together.

WHAT I have farther to add is, that with respect to the merit a candid Reader may allow this Work, the very smallest part of it is mine. Whatever addition may be found here, to the knowledge of vegetable nature; or whatever improvements may be deduced from the succeeding parts; in medicine, or in the arts and commerce, the Public owe it all to one great personage, to whom they do, and I think will, owe infinitely more than these slight tributes. His attention to whatever may concern the welfare of Britain, has influenced him to countenance this study. His superior genius formed the Plan, and his munificence enables me to execute it: he raised me from low cares, that I might attend to it, with that quietness of mind which is required for works of Science: he supports the garden where the Plants are raised; and he directs how the study of them may be made most useful. I am but as the hand which executes these great designs. It is sufficient glory for me to have been chosen for that purpose; nor can I wish a greater happiness than to be thus made instrumental to the good of mankind.

Bays-water,
Oct. 4, 1761.

INTRODUCTION.

WE have seen how Plants are formed; and we may now proceed to enquire into the Manner wherein they are nourished: the Structure and the true Course of their Juices being known, it remains only that we examine what those Juices originally are, whence they are deduced, and by what Powers they are conveyed into the Vegetable Organs. These Resources and these Powers are to be sought among the Elements. This Enquiry will shew the Dependence and Analogy there is between the vast constituent Parts of this our System and those lesser Objects their Productions; it will give us the just Connection between natural Philosophy and natural History, and shew that there is no Part of the Creation disjoined from the rest, but all connected and dependent, the whole one vast unbroken and uninterrupted Chain, the imagined Divisions of which have no Foundation but in our imperfect Knowledge.

FROM this general View of the Vegetable World, we shall be led regularly to the distinct Forms and Situation of their several Parts, on which the greater and lesser Arrangements of Class, Order, Genus, and Species are established; and these being explained in familiar Words, and ascertained by an exact Representation of their Forms, we may proceed with Certainty to the Distinction of the Plants themselves, their History and their Figures.

INTRODUCTION

The purpose of this book is to provide a comprehensive overview of the various aspects of the subject matter.

It is intended for use by students and researchers alike, and is designed to be both informative and accessible.

The book is divided into several chapters, each of which deals with a specific aspect of the subject.

The first chapter provides a general introduction to the subject, and the subsequent chapters deal with more specific topics.

The book is written in a clear and concise style, and is intended to be both informative and accessible.

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B O O K I.



ON THE
E F F E C T S
OF THE
E L E M E N T S and S E A S O N S
UPON
V E G E T A B L E B O D I E S.



C H A P. I.

The EFFECTS of HEAT, or FIRE, on VEGETABLES.

HEAT is necessary in some degree to all Plants; and in various proportions to the different kinds: but it is the same from whatsoever source they receive it. The Plant will thrive if the air have a due warmth, whether that be occasioned by the sun, or a common fire. 'Tis hence our stoves support the Vegetables of the hottest climates.

THOSE which are natives of colder regions require less Heat; but some portion of this actuating Element is of absolute necessity to all: without it the Juices would be frozen; and vegetative Life would cease. 'Tis therefore Heat has been called, in the modern metaphoric language, the HEART of Plants: it keeps the Juices fluid, and by the expansion and contraction of the parts, according to its various degrees, is the great cause that puts them first in motion. Therefore the more warmth there is in any place, the finer Plants should be produced there; and we see this in fact: the hottest countries affording in general the tallest trees, the largest flowers, and the finest fruits.

THE power of Heat is so great on plants, that an excess or deficiency of it in any considerable degree, is equally fatal. That which was natural to them in their own soil supports them also in our stoves: but more or less changes their time of duration, and equally destroys them, though by different means.

PERENNIAL Plants of somewhat warmer climates become annual in those a little colder. The earth wants Heat in Winter to keep up the primary circulation which is in the Flesh of the root; and it decays: but Seeds being ripened first, the Vegetable may be raised in Spring and live the Summer. Many of those whose woody Stems naturally remain throughout the year, when they are brought where there is less Heat lose them in Winter; but the Root, being hardier, lives. Thus weak Shrubs of warmer climates are reduced to the condition of perennial Plants in those which are somewhat colder; and perennial Plants to annual. This change is in many in-

stances reciprocal: Plants which are annual here living through Winter in more southern countries; and those which lose their Stalks retaining them there throughout all Seasons.

THAT Heat is thus essential to Vegetation, and thus appropriated in the degree to Plants, according to their native place, we see by the effects of an inconsiderate encrease or diminution. The more Heat a Plant receives the thinner are its Juices, the swifter they move, and the faster it grows: therefore if we give any Species much more than its natural proportion it becomes luxuriant; but nature will not be forced thus with safety: it fades soon after; and perishes inevitably. On the contrary, if we allow less than the natural Heat, in any important degree, the Plant, though it continues to live, ceases growing; it produces no Flowers or Fruit; and if the warmth be still something more decreased, it loses the Leaves, and dies absolutely.

THUS we see a great deal is owing to Heat: but it is not so much as has been thought: for the same climates, countries in remote parts of the earth where the degree of Heat is alike, do not produce the same Plants; but often the most different. ROME and PEKIN are nearly in the same latitude, but what can be more different than the ITALIAN and CHINESE Plants? The CAPE of GOOD HOPE may be matched in latitude by different places; but no where in its Vegetables: they are peculiar, and distinct from those of all the world; and are perhaps more beautiful. In these places the heat is nearly equal, but the Plants are different; the air has the same warmth, but Vegetation takes quite another course. Therefore we are to seek the variation in some other cause; and naturally in the other Elements.

C H A P. II.

Of the EFFECTS of AIR in VEGETATION.

AIR is not less necessary to Plants than Fire. When shut up from it entirely, they die equally; or when it is withdrawn from them in less degrees, they fade in proportion. Seeds will not grow in the receiver of an air-pump, when carefully exhausted; and vigorous young Plants die.

VEGETABLES will live in the same quantity of confined Air much longer than animals; for they fill it less by their cool perspiration: but it is only for a certain time they will bear it. If a Sprig of Mint be set in water in a bottle open, and a like one in a bottle corked, they will for many days grow with equal vigour; but afterwards the Plant that is corked up will begin to fade: its Juices stagnate, mouldyness appears upon its extreme parts, and it dies. Therefore not only Air, but a free Air is necessary to Plants; and Vegetation is affected by all its changes, and its natural differences.

THE thinnest Air is on the tops of mountains; and its effects on Vegetation are uniform and constant there. We have seen the Plants of different places under equal latitudes vary greatly in stature and in species, though the Heat be the same: perhaps, nay probably, the difference of Air makes the change; for where that is alike, Vegetation is alike also. The high mountains of all parts of the world afford the same aspect in their Vegetables: all are low but hardy: we see the Shrubs of the same humble height on MOUNT OLYMPUS and the Hills of GREENLAND; the ALPS and PYRENEANS, the Mountains of the BRASILS and of LAPLAND yield the same crops of vegetable nature; nay, there is no difference between the productions of our own WELSH Mountains, and of ARARAT. Not only Plants of the same height, but the same Plants, the same Species, are found on all these mountains, though they are so remote, and under such different latitudes. Heat cannot do this, for there are no Plants common to all hot countries; and Cold is but a negative quality; the want of Heat, and nothing more. The Soil is different on these various mountains; so it is

not that which occasions this amazing regularity and sameness in their productions. It is therefore in the Air we are to seek the cause: and we may learn from this single instance its great qualities in regard to Vegetation. Air is of absolute necessity to vegetable life, and makes a part of the bodies of all Plants; as is constantly found in their analysis: but it is not pure Air that raises them to height, or gives their specious Flowers: Air loaded with moist vapours, and actuated by considerable Heat, feeds the vegetable faculties most freely.

C H A P. III.

Of the EFFECTS of EARTH in VEGETATION.

EARTH is the food of Plants; and constitutes their substance: from this they arise, and to this they return. Water will support some kinds, but 'tis by means of the Earth which it contains: and Earth owes to water the power of entering the vessels in all Vegetables. The Plants which grow in sun-burnt deserts and parched sands are no objection; for they are supplied from the air, as Sea-plants from the water; imbibing nourishment at their whole surface.

As the Earth wherein Plants grow is more or less soluble in water, they flourish more or less; and there is some difference also in the state of it. Pure black mould is of all Earths the most soluble, therefore Plants grow largest in this. The mould of garden-borders is an instance: and in wild nature the Burdock, Thistles, and Hemlock shew themselves upon this Soil in all their lofty stature: on the contrary, Clay, which dissolves more difficultly, affords the low Knotgrass, Swines-cress, and some of the hardier Trefoils. Chalk offers certain species somewhat larger, as it is something more dissoluble; the Kidney-vetch, the Refeda, and the Campanulas. Sand has its place in the enquiries of an excellent guide, LINNÆUS, on this head; but certainly without just reason. Sand is a debased Crystal: this cannot be broke or dissolved at all by the water; it is not Earth, nor can it nourish Plants. Those which are found on sandy soils are fed only by the loose Earth which happens to be among the Sand: therefore they are less constant in their nature. Where Sands are very poor, we see the low Plants, Rupture-wort and starved Serpyllum; when there is more Earth among them we see Grasses or Reeds, or shrubby Heath or the tall Foxglove. There is no certain character of the Plants of sandy Sods, because they depend upon the kind and quantity of real Earth which is among the Sand.

EARTH of a less proper kind may feed Plants luxuriantly when art or accident have rendered it more soluble in water: it is hence that the field-culture makes Vegetables large: and hence ditch-banks of Clay, after they have been raised a time, feed the tall Navew: what the implements of husbandry effect in the first case the air does in the other; breaking and mellowing the soil, and rendering it easier to be dissolved by water. It is thus manures act also: they raise a fermentation which divides the Earth; and it becomes fit for giving nourishment to Plants: for many of those ingredients which effect this change in Earth will not feed Plants alone: salt, sea-weed, foot, and rags, and many more are instances: all of which yet in a certain proportion, ferment and break tough Earths, and render them more fit for Vegetation.

No Plant can grow without Earth, for that must make its substance: such Earth as water can dissolve most easily, answers this purpose best; and others in proportion as art and industry bring them nearer to this state. We are not to suppose Plants feed on any thing else: those which live in water are certainly fed by the Earth contained in that water; those upon rocks, by dust blown into their crevices and washed down by rains; those upon walls, by the mould among the mortar; and even those on dunghills, by the Earth mixed among the mass; for absolute dung will not support any Plant beyond a little fungus.

C H A P.

C H A P. IV.

Of the EFFECTS of WATER in VEGETATION.

HEAT itself is not more immediately necessary to Vegetation than Water. Tho' earth is the food of Plants; it is Water which conveys this to their several parts. This enters the Roots, carrying with it a certain quantity of the earth, which it leaves behind in the Plant to encrease its solid substance, itself evaporating through the leaves. Dry earth, in ever so small particles, could not be received into the vessels; nor if received, could it pass through them. There is necessity of a Fluid to give it entrance and conveyance; and the Fluid nature furnishes is Water. Rains give this to the earth, and it is detained at a small depth beneath the surface, where the Roots run: the air also abounds with it: so that the Plant is supplied by day, one of these ways, and during night the other; and cannot but receive it.

A CERTAIN proportion of Moisture is also necessary, for the health of the Plant, to be retained always within its Vessels. This Moisture is not pure Water, for it is the Juice of the Herb; but it was Water first, and as it wastes must be supplied by Water. The sun exhales it all day long, and the Plant fades under his influence only for that reason: but the evening-dews restore it.

PLANTS set in mould of ever so rich a kind, if it be absolutely dry, receive no nourishment; but fade instantly and irrecoverably. On the other hand, any Plant set in Water, and covered to keep in the Moisture it exhales, will live and grow. We think some Plants will live in Water, and others not: but all will do it if the moist vapour they exhale be returned upon them. Those which live in the open air with their Stems plunged in Water perspire less, and therefore a less supply will preserve them; those which evaporate more require to be supplied also from their Leaves imbibing a moist Atmosphere. This is all the difference.

ON Water thus evaporated, and thus received, depends in a great measure the peculiarity of certain Plants being found in certain climates; and the singularity observed before, that though different countries, under various climates, produce distinct Plants, those in the same latitudes are not always the same. Not only a certain warmth in the air, but an appropriated construction of the parts of evaporation is requisite for this purpose. Plants whose leaves have the same or a like texture are found in different countries under equal latitudes; but those which are particular in this respect, perspiring, whether it be less or more than the usual proportion, can be found only in those places, under an equal heat, which, from the degree of Moisture in the air, afford a proportioned supply.

THUS Water is eminently concerned in that peculiarity of Plants and places, the cause of which must have been sought in vain, while the whole was attributed to heat. A proof of this is evident in those species which live under Water; for there evaporation and absorption being small and simple, and the degree of heat tempered extremely by the depth, the same species are found in the most distant climates: thus the common yellow Water-lily and the Lenticularia, with several other ENGLISH Plants, which grow under deep Waters, are found in CHINA and the INDIES; though they have also others of the same species which are not known here.

To prove that it is the state of the Plant respective to its evaporation which occasions this, we may add to the list the common Sun-dew, whose exhausted Fluid is received again, not lost: for this Plant is common also in the INDIES.

C H A P.

C H A P. V.

Of the EFFECTS of SEASONS upon VEGETATION.

THE power of the Elements on vegetable Bodies being ascertained, we may rationally enquire into the changes brought on by various Seasons. Summer and Winter, Spring and Autumn differ no otherwise from one another than in the proportions of heat and cold, moisture and dryness. All their distinctions rest upon the various degrees of fire, and water, and the effects these take upon the two other Elements, earth and air : and all the changes they produce in Plants, in the same manner depend upon the variations in those Elements. While too much was attributed to heat, and consequently too little to all the rest, these enquiries could not be prosecuted with any degree of certainty : but when the whole is placed before the eye together, and the Elements are considered, not only simply, but in their several combinations, perhaps this subject will be better understood.

WINTER acts only on Plants by the diminution of heat. We have seen what are the effects of this principle in its more perfect stages and degrees ; and we may therefore easily understand how that Season produces changes in Plants by its deprivation. It is heat that raises the juices of Vegetables ; and they in their ascent forming their own vessels, as has been shewn in the preceding volume, the plant rises above the ground. As heat causes this, the Vegetables of equal natural strength will be tallest where there is most heat, all other things being equal. This we see in fact, for the loftiest trees grow in the hottest climates. Therefore when the degree of heat which raised our humble Plants to their proper height ceases at the close of Summer, the Body cannot be supported at the height to which it was carried ; and it dies to the ground. The Root requires a less degree of warmth to keep it in a state of potential life ; therefore the small remains of Heat that are under the surface in Winter preserve this : but in extreme frost it also decays : the Juices are reduced to ice, and the Root no more recovers. This is the effect of Winter upon the generality of our Plants. Annuals requiring more heat than perennials, perish Root and all, at the approach of the cold ; and Trees by the hard matter of their trunks defend the inclosed Juices : these are not contradictions of the general law ; but natural exceptions.

THE warmth of Spring begins again to rouse the stagnant Juices of perennial Roots, and call them upwards : at the same time the earth, the Plants certain food, is moistened and dissolved by the rains of that Season : therefore it is in the just condition to afford a full supply. Thus the vegetable extends, and is increased, and grows, through this time, and the succeeding Summer ; till the chill Autumn stops its progress ; if it have not before been terminated by fructification. According to the stronger or weaker texture of its parts it either dies entire, as in the annual kind ; or what is under ground remains, as in perennials ; or its trunk and branches firm, though naked, preserve themselves through Winter, as Roots above the ground, losing only the tenderer parts, their Leaves ; nor always those.

C H A P. VI.

Of the RISE and FALL of the SAP.

WE have seen that it is heat which principally occasions the Rise of the Juices in vegetables : and therefore this ascent is greatest in the hottest seasons. In Plants it is only in those seasons that it takes place ; but in trees whose firmness preserves them above ground, there is some rise of the Sap at all times, even in the depth of winter. Reason declares this, and

what we see confirms it. The branch of a Vine which grows in the open air, near a stove, being let into that warm place, will shoot out leaves, and bud and blossom and bear fruit even in the depth of Winter: while all the rest of the same Vine is naked. Therefore even in dead Winter Sap rises in the Vine; although it has not force to shoot out Leaves and Flowers till natural or artificial heat promote it.

THE great cause of the Rise of Sap from the Root is the heat of the air: the fall, or propulsion downward is owing to the quantity of moisture received by the Leaves in the evening; which presses down the Juice in the Vessels. Part of this has been exhausted during the day, and the remainder being condensed by the night's cold does not fill those Vessels: the quantity received above occupies the vacant space, and by its mere weight forces the rest down towards the Root; till the next day's heat evaporates more from the Leaves, and raises more from the Root again: and this is the cause of every day's motion in the Sap.

THERE is no season in which there is not some heat in the air; and therefore there is no time when some Sap does not rise: the Winter Vine shews this; and there are other proofs, which naturally have their place in the succeeding Chapter. What has been called the Rise of Sap into the Trunks of trees in Spring, and its Fall into their Roots in Winter, is in reality no more than the ascent of the Juices in a greater or less quantity, proportioned to the warmth of the air. In Autumn the Sap ceases to rise in any obvious quantity, and through Winter the same state holds: this is called the Fall of the Sap into the Root. But we see there is not only no Fall, but there is a real Rise at that time, though little: when Spring-suns warm the air, and rains give abundant moisture to the earth and atmosphere, the Juices ascend in visible and vast quantities: and this is called the Rise of the Sap in Trees. It is needful to explain the doctrine, though erroneous; for it is not in nature a Rise and Fall of these Juices, but a swifter and more abundant, or a slower and less copious ascent. Universal nature shews that there is no part of any Plant firm enough in its texture to support itself above the ground, wherein there is not, even in the coldest seasons, a Rise of Sap, though it be little in quantity; for when that ceases they perish. Vegetable bodies preserve their power of growth only so long as there is vegetative life in them: and vegetative life consists in a motion of the Juices.

C H A P. VII.

Of the FALL and PERMANENCY of the LEAF.

THE Fall or fading of the Leaves at Autumn, or their retention all Winter in life and vigour on the Tree, affords a great, an obvious, and a valuable distinction: yet it is not so certain as has been supposed; nor can it be accounted for so easily. Hypotheses without proofs in nature solve all problems quickly; but the advances made by observation are slow. They have however their reward: they are eternal.

DISTINCTIONS have been established on the characters of the Evergreen and deciduous-leaved Trees: but stricter observation shews that the same Tree will in one climate drop its Leaves in Autumn, which in another holds them all the Winter. The country where the Leaves are kept thro' Winter is always warmer than that wherein the same Tree loses them in Autumn: and this leads us one step toward the general cause why some Trees lose and others hold them. Warmth gives rise to the sap, and the greater the degree of warmth is the more sap rises: but we find there are in the same climate some Trees which hold and others which drop their Leaves; though the warmth be equal. The Box and Holly are green with us all Winter; while the Sallow and Hawthorn, and the generality of others, lose their Leaves at Autumn: therefore it is evident, though the degree of heat be a part of the cause, we must seek farther for the whole. Perhaps the error hitherto has been the attributing to one principle what was the result of two or more.

THE

THE VEGETABLE SYSTEM.

7

THE cause why Trees lose their Leaves with us at Autumn is evidently the same that makes Plants lose their Stalks and die down to the ground : and this is the want of heat to raise the Juices to them : but we have seen that some Sap rises in all Trees in Winter ; and if we would know why this quantity of sap is enough to keep the Leaves alive in certain kinds, and not in others, we must seek it in those Juices, and their texture.

THE Juices of the Hawthorn are thin and watery ; those of the Holly are thick even to a degree approaching to bird-lime : the Leaf of the Hawthorn is full of large pores for evaporation ; the Leaf of Holly has few and small : this holds in all the deciduous-leaved and evergreen Trees in a greater or less degree : these are selected only because it is most obvious in them. This gives the reason of the difference ; and explains why in a warmer climate the same species may keep the Leaf which here lose it. Leaves fall because the supply of Juices from the Root is not equal to the waste by evaporation : and therefore those which perspire or evaporate most will fall first, and those which lose this way the least quantity of their Juices will last longest. The Leaves are kept on Trees by a due supply of moisture from the Root : it is not that the Holly has more of this supply than the Hawthorn ; but it loses less : which in the end is just the same.

DECIDUOUS-LEAVED Trees become Evergreens in countries where the increased warmth of the air gives this supply ; and in our own country the Holly and the like retain their Leaves, because the small pores and the thickened nature of the Juice prevent evaporation. The Sap is watery when it is received at the Root ; but by that time it reaches the Leaves it is assimilated, and becomes of the nature of the Plant : therefore the tougher the Juices of the Plant are, the less supply will answer ; because it is so much the more secure from loss by evaporation. This and the close texture of the Leaves themselves together give the quality of retaining the Leaves : and we see this illustrated by a most plain example in grafted and inoculated Trees, where the Stock is a deciduous-leaved kind, and the graft an Evergreen. Many of the AMERICAN Oaks are Evergreen, and when we raise them on the stock of our own Oak, which is deciduous, they yet retain their leaves all Winter.

B O O K II.

Of the EXTERNAL PARTS of PLANTS.

PLANTS are composed of various parts, that serve either for their GROWTH or PROPAGATION ; the general name of the first is Vegetation ; of the second, Fructification.

UNDER these two all parts are disposed :

I

I. A TABLE

I. A TABLE of the PARTS of PLANTS subservient to their GROWTH.

I. RADIX, the ROOT. See Plates 1 and 2.

This is,

I. BULBOSA, BULBOUS.

Which is,

1. SOLIDA, SOLID, as the Crocus.
Pl. 1. Fig. 1.
2. TUNICATA, COATED, as the Onion.
Pl. 1. Fig. 2.
3. SQUAMOSA. SCALY, as the Lilly.
Pl. 1. Fig. 3.
4. UNICA, SINGLE, as the Amaryllis, and most Bulbs.
Pl. 1. Fig. 4.
5. DUPLICATA, PAIR'D, as the Fritillary.
Pl. 1. Fig. 5.
6. AGGREGATA, CLUSTERED, as the Lady Traces.
Pl. 1. Fig. 6.
7. PALMATA, HANDED, as the handed ORCHIS.
Pl. 1. Fig. 6.

II. TUBEROSA, TUBEROSE.

Which is,

1. SESSILIS, JOINED TO THE STEM, as Cannacorus.
Pl. 1. Fig. 8.
2. PENDULA, HANGING TOGETHER BY THREADS, as Filipendula.
Pl. 1. F. 9.
3. FASCICULATA, FAGGOTED, as Piony.
Pl. 1. Fig. 10.
4. ARTICULATA, JOINTED, as Martynia.
Pl. 1. Fig. 11.
5. FUSIFORMIS, SPINDLED, as Carrot.
Pl. 1. Fig. 12.
6. GLOBOSA, ROUNDED, as Crowfoot.
Pl. 1. Fig. 13.

III. FIBROSA ET OBLONGA. FIBROUS AND OBLONG. These consist of two Parts.

1. The CANDEX DESCENDENS, or Body of the Root.
2. The RADICULÆ, FIBRES in which it terminates, as the Long Rooted Hawk-weed. Pl. 2. Fig. 1. *a* the Candex, or Body ; *b* the Fibres.

The Perennial Kinds are usually crowned also with Buds, as in the Willow-herb. Pl. 2. Fig. 2.

The Fibrous Root is either,

3. CARNOSA, FLESHY, as Valerian.
Pl. 2. Fig. 3.

Or,

4. FILAMENTOSA, THREADY, as Grass.
Pl. 2. Fig. 4.

The others are either,

5. SIMPLEX, SIMPLE, undivided, as Mallow.
Pl. 2. Fig. 5.
6. RAMOSA, BRANCHED, as Nettle.
Pl. 2. Fig. 6.
7. HORIZONTALIS, HORIZONTAL, as Polypody.
Pl. 2. Fig. 7.
8. PERPENDICULARIS, PERPENDICULAR, as Dock.
Pl. 2. Fig. 8.
9. INCLINATUS, INCLINED, as Thrift.
Pl. 2. Fig. 9.
10. REPENS, CREEPING, as Mint.
Pl. 2. Fig. 10.
11. PRÆMORSA, ABRUPT, as Plantain.
Pl. 2. Fig. 11.

II. CAUDEX, the STEM. See Plates 3 and 4.

This includes,

I. TRUNCUS, the TRUNK of TREES, SHRUBS, and UNDERSHRUBS.

II. CAULIS, the STALK of HERBS.

These two are,

I. SIMPLEX, SIMPLE, where the Stem grows uninterrupted to the top.

I. INTEGER, UNBRANCHED, without Side-boughs.

1. NUDUS, NAKED, without Leaves, as Dodder. Pl. 3. Fig. 1.
2. FOLIOSUS, FOLIATED, with Leaves, as Gladiole. Pl. 3. Fig. 2.
3. RECTUS, UPRIGHT, as Gentianella. Pl. 3. Fig. 3.
4. OBLIQUUS, INCLINING, as Aphaca. Pl. 3. Fig. 4.
5. FLEXUOSUS, CROOKED, as Smilax. Pl. 3. Fig. 5.
6. VOLUBILIS, TWINING, as Bryony. Pl. 3. Fig. 6.
7. PROCUMBENS, LYING DOWN, as blue Bindweed. Pl. 3. Fig. 7.
8. REPENS, CREEPING, as Marsh Pennywort. Pl. 3. Fig. 8.
9. SARMENTOSUS, PRODUCING RUNNERS, as Asarabacca. Pl. 3. Fig. 9.
10. TERES, CYLINDRICAL, as the Tulip. Pl. 3. Fig. 10.
11. ANCEPS, TWO-CORNERED, or ANGLED, as Bermudiana. Pl. 3. Fig. 11.
12. TRIGONUS, THREE-CORNERED, as Long Cyperus. Pl. 3. Fig. 12.
13. TETRAGONUS, SQUARE, as Mint. Pl. 3. Fig. 13.
14. POLYGONUS, MANY-CORNERED, as the Cereus. Pl. 3. Fig. 14.
15. STRIATUS, STRIATED, or CHANNELLED, as Spiderwort. Pl. 3. Fig. 15.
16. CANALICULATUS, FLUTED, as Water Dropwort. Pl. 3. Fig. 16.
17. GLABER, SMOOTH, as Asphodell. Pl. 3. Fig. 17.
18. VILLOSUS, WOOLLY, as Pasque-flower. Pl. 3. Fig. 18.
19. SCABER, ROUGH, as Cleavers. Pl. 2. Fig. 19.
20. HISPIDUS, HARSH, Covered with hairy Prickles, as harsh Rudbeckia.
Pl. 3. Fig. 20.
21. PARASITICUS, PARASITIC, growing on another Plant, as Tillandsia.
Pl. 3. Fig. 21.

II. RAMOSUS, BRANCHED, or having Shoots from the Sides.

1. ASCENDENS, ASCENDING, the Branches rising upwards, as Rose-Campion. Pl. 4. Fig. 1.
2. DIFFUSUS, SPREADING, as Columbine. Pl. 4. Fig. 2.
3. BRACHIATUS, IN GREAT ARMS, as Eryngium. Pl. 4. Fig. 3.
4. RAMOSSIMUS, IN MANY SMALL BOUGHS, as Candy Alexanders. Pl. 4. Fig. 4.

To these also belong all the Distinctions of the CAULIX, SIMPLEX INTEGER.

II. COMPOSITUS, COMPOUND, the Stem losing itself in the Branches.

1. DICHOTOMUS, FORKED, as Lambs Lettuce. Pl. 4. Fig. 5.
2. DISTICHUS, SPREAD, having double Rows of horizontal Branches, as Burnet Rose. Pl. 4. Fig. 6.
3. SUBDIVISUS, SUBDIVIDED, as Woad. Pl. 4. Fig. 7.
4. FULCRATUS, PROP'D, as Indian Fig. Pl. 4. Fig. 8.
5. PROLIFER, PROLIFEROUS, as the Pine. Pl. 4. Fig. 9.
6. NODOSUS, JOINTED, as Pepper. Pl. 4. Fig. 10.

III. CULMUS, STRAW, the Stalk of Grass.

1. ENODIS, SMOOTH, as Sea Grass. Pl. 4. Fig. 11.
2. INTEGER, SIMPLE, as Dogs-grass. Pl. 4. Fig. 12.
3. RAMOSUS, BRANCHED, as Water-grass. Pl. 4. Fig. 13.
4. EQUALIS, EQUAL, having no Protuberances, as Woodgrass. Pl. 4. Fig. 14.
5. ARTICULATUS, ARTICULATED, Jointed, as Manna-grass. Pl. 4. Fig. 15.
6. SQUAMOSUS, SCALY, as Sea Dogs-grass. Pl. 4. Fig. 16.
7. NUDUS, NAKED, as spiked Water-grass. Pl. 4. Fig. 17.
8. FOLIOSUS, FOLIATED, as common Meadow-grass. Pl. 4. Fig. 18.

IV. SCAPUS, FLOWER-STEM, a simple Stalk rising directly from the Root.

1. NUDUS, NAKED, as Hyacinth. Pl. 4. Fig. 19.
2. FOLIOSUS, FOLIATED, as Dogs-tooth. Pl. 4. Fig. 20.

III. FULCRA, the SUPPORTS or APPENDAGES. See Plate 5.

These are Parts that either support or defend others. And first,

I. PEDUNCULUS, PEDICLE, a Stalk carrying the Fructification.

1. UNICAM, a SINGLE FRUCTIFICATION, as the Lilly. Pl. 5. Fig. 1.
2. GEMINAM, DOUBLE, as the Mexican Amaryllis. Pl. 5. Fig. 2.
3. PLURIMAM, MANY, as the Plumeria. Pl. 5. Fig. 3.
4. NUMEROSAM, VERY NUMEROUS, as Geranium. Pl. 5. Fig. 4.
5. RADICALEM, ROOTED, issuing from the Root, as Cyclamen. Pl. 5. Fig. 5.
6. CAULINAM, STALKED, proceeding from the Stem, as Hibiscus. Pl. 5. Fig. 6.
7. ALAREM, WINGED, growing from the Junction of the Bough to the Stem, Campanula. Pl. 5. Fig. 7.
8. TERMINATRICEM, TERMINATING the Branch or Stem, as Herb-Paris. Pl. 5. Fig. 8.
9. SOLITARIAM, ONLY ONE PEDICLE, as Globe Crowfoot. Pl. 5. Fig. 9.
10. SPARSIM, SEVERAL UP AND DOWN, as alternate Gladiolus. Pl. 5. Fig. 10.
11. CONGLOBATAM, GATHERED IN A BALL, as Globe Amaranth. Pl. 5. Fig. 11.
12. CONGLOMERATAM, IN SEVERAL LITTLE BODIES, as Foxtail Astragalus. Pl. 5. Fig. 12.
13. PANNICULATUM, PANNICLED, as Bent-grass. Pl. 5. Fig. 13.
14. CORYBOSAM, IN ROUND BUNCHES, as Camara. Pl. 5. Fig. 14.
15. FASCICULATAM, IN LITTLE FAGGOTS, the Bottoms all issuing from the same Point, as Sweet William. Pl. 5. Fig. 15.
16. UMBELLATIM, UMBRELLA'D, as Chervil. Pl. 5. Fig. 16.
17. CAPITAM, HEADED, as Corn-flower. Pl. 5. Fig. 17.
18. VERTICILLATIM, WHORLED, as Molucca Baum. Pl. 6. Fig. 18.
19. SPICATIM, SPIKED, as Veronica. Pl. 5. Fig. 19.
20. THYRSATIM, TOWERED, in a Sort of Spike like a Pine Cone, as Butter-burr. Pl. 5. Fig. 20.
21. RACEMOSIM, GROWING THICK ALONG THE BRANCHES, as Arbutus. Pl. 5. Fig. 21.

II. PETIOLUS, the LEAF-STALK, as in Heliotrope. Pl. 5. Fig. 22.

III. CIRRHUS, the CLASPER, or TENDRIL, as Trichosanthes. Pl. 5. Fig. 23.

IV. BRACTEA, the SCALE, or FLORAL-LEAF, never appearing but with the Flower, as in the Lime. Pl. 5. Fig. 24.

V. STIPULA, the FILM, as in the Rose. Pl. 5. Fig. 25.

VI. ACULEUS, a PRICKLE, this grows to the Rind, and may be separated, without tearing the Plant, as in the Bramble. Pl. 5. Fig. 26.

VII. SPINA, a THORN, this grows from the Wood; and tears the Plant when separated, as Buckthorn. Pl. 5. Fig. 27.

VIII. GLANDULA, a GLAND, or SEPARATING DUCT, as in the Passion Flower. Pl. 5. Fig. 28.

IX. SQUAMMA, a SCALE, as in the Clandestina. Pl. 5. Fig. 29.

IV. FOLIA, LEAVES. See Plates 6, 7, 8, 9.

The Leaf of a Plant is either,

I. SIMPLEX, SINGLE, one upon a Stalk. This admits of being considered seven different ways; and first as to its

I. CIRCUMSCRIPTIO, CIRCUMFERENCE. This depends on the Round of the Leaf considered as entire, abstracting from its Angles and Sinuses, and not regarding the Extremity of the Sides and Top. In this Light there are,

1. ORBICULATUM, ROUND, viz. Length and Breadth equal, and the Sides equally distant from the Center, as Navelwort. Pl. 6. Fig. 1.
2. SUBROTUNDUM, ROUNDISH, viz. broader than long, tho' used with more Latitude to express the first, as round-leaved Cyclamen. Pl. 6. Fig. 2.
3. OVATUM, EGG'D, longer than broad; the Bottom in the Segment of a Circle, but tapering to the Top, as Yellow Pimpernel. Pl. 6. Fig. 3.
- * 4. OBLVERSE-OVATUM, REVERS'D-EGG'D, viz. the lesser End joined to the Stalk, as Samolus. Pl. 6. Fig. 4.
4. OVALE, OVAL or ELLIPTICAL, viz. longer than broad, but both Top and Bottom Segments of Circles, as Turnsole. Pl. 6. Fig. 5.
5. OBLONGUM, OBLONG, viz. whose Length exceeds several times the Breadth, but narrower at Top and Bottom than the Segment of a Circle, as Peach-leav'd Bellflower. Pl. 6. Fig. 6.
7. SPATULATUM, SPATULA'D, that is, rounded with an oblong, narrow Base as Indian Bellflower. Pl. 6. Fig. 7.
8. PARABOLICUM, LONG OVAL, an oblong Oval narrowed to the Top, as small Amaryllis. Pl. 6. Fig. 8.
9. CUNEIFORME, WEDG'D, the Stalk supporting the small End, as Dwarf Auricula. Pl. 6. Fig. 9.

II. ANGULI, ANGLES, viz. the salient Parts of a Leaf, contrary to the inward Angle, called Sinus, which does not exist in the Leaf, but is an empty Space formed by Part of the Leaf being taken away. Angles are all different from Latera, the Sides; these are only in a Plant placed perpendicular, as Torch-Thistle, &c. Angles in flat horizontal Leaf. These are expressed by,

10. LANCEOLATUM, LANCED, this is the fifth, but more tapering from the Middle to the Top and Base, as Spearwort Crowfoot. Pl. 6. Fig. 10.
11. LINEARE, LINEAR, two Sides parallel, tho' often approaching towards the Top and Base, as Toadflax. Pl. 6. Fig. 11.
12. SUBULATUM, AWL'D, linear to the Middle, thence to the Top gently sloping so as to meet, as Spike Lavender. Pl. 6. Fig. 12.
13. ACEROSUM, CHAFFY, that is linear and permanent, with a chaffy Base, as Pine. Pl. 6. Fig. 13.
14. TRIANGULARE. In these the Sides are formed by strait Lines, and the lower Angles horizontal with the Base, as in White Orach. Pl. 6. Fig. 14.
15. DELTOIDES, QUADRANGLED, the Side ones nearer the Middle than those at the Top and Base, as Sea Purslain-tree. Pl. 6. Fig. 15.
16. QUINQUANGULARE, PENTANGULAR, the Sides strait Lines, unless (as sometimes happens) they are broken by Sinus's, as Sanicle. Pl. 6. Fig. 16.
17. ROTUNDATUM, ROUNDED, this having no Angles, is the opposite of the last mentioned Kinds, as Sundew. Pl. 9. Fig. 17.

III. SINUS, the SINES or INWARD ANGLES. These are at the Base, at the Top, at the Sides, or all around.

18. RENIFORME, KIDNEY-SHAPED, is the 2d, hollowed out at the Base, without Angles, as Asarabacca. Pl. 6. Fig. 18.
19. CORDATUM, HEARTED, is the 2d, hollowed at the Base, without large Angles, as Parnassia. Pl. 8. Fig. 19.
20. OBFERSE CORDATUM, THE FORMER REVERS'D, viz. when the Pedicle joins the Top, as Heart Trefoil. Pl. 6. Fig. 20.
21. LUNALATUM, MOON'D, the 2d, hollowed at the Base, with the Angles Hook-shaped, as Indian Arrowhead. Pl. 6. Fig. 21.
22. SAGITATUM, ARROW'D, is the 10th, hollowed at the Base, as common Water Arrowhead. Pl. 6. Fig. 22.
23. CORDATO SAGITATUM, THE FORMER WITH CONVEX SIDES, as Black Bindweed. Pl. 6. Fig. 23.
24. HASTATUM, SPEAR'D, the 10th, with the Base and Sides scooped hollow, the Angles pointing downwards, as English Mercury. Pl. 6. Fig. 24.
25. PANDURI-FORME, FIDDLED, is the 5th, swelling out at the Top, more at the Bottom; but shrinking in at the Sides, as Fiddle Dock. Pl. 6. Fig. 25.
26. BIFIDUM, BIFID, a Leaf divided at the Top in two, the inward Sides of the Division strait, and this holds (Number excepted) for 3fid, 4fid, &c. as Stary Water Plantain. Pl. 6. Fig. 26.
27. TRILOBUM, THREE-LOBED, viz. divided to the Middle in three Parts that spread asunder, with convex Margins, and the same of two lob'd, four lob'd, &c. (Number excepted) as Bastard Cinquefoil. Pl. 6. Fig. 27.
28. PALMATIM, PALMED, divided like the Hand, from the Top beyond the Middle, or even to the Base, as Ricinus. Pl. 6. Fig. 28.
29. PEDATUM, FOOTED, handed, but with the Footstalk continued and divided, as Hellebore. Pl. 6. Fig. 29.
30. PINNATIFIDUM, FEATHERED, cut into several long horizontal Slips, separated by horizontal Sinus's, as Star Thistle. Pl. 6. Fig. 30.
31. LYRATUM, HARPED, cut transversely in Jaggs, and largest upwards, as Winter Cress. Pl. 6. Fig. 31.
32. LACINIATUM, JAGGED, when cut to the Middle by several Sinus's, and the Lobes subdivided, as Ragwort. Pl. 6. Fig. 32.
33. SINUATUM, OPENED, when there are several Sinus's round the Leaf separated by Lobes scarcely divided, as Saxifrage. Pl. 6. Fig. 33.
34. PARTITUM, PARTED TO THE BASE, as wild Columbine. Pl. 6. Fig. 34. This is Quinqu partite, or divided into five: It is the same of Bipartitum, Tripartitum, &c. Number excepted.
35. DIVISUM, DIVIDED, cut deep, with great Segments, as Solstitial Thistle. Pl. 6. Fig. 35.
36. BIPARTITUM, TWICE DIVIDED, cut into deep Lobes, and those split again, as wild Shrub Cinquefoil. Pl. 6. Fig. 36.
37. INTEGRUM, ENTIRE, as long-leav'd Cistus. Pl. 6. Fig. 37. Therefore opposed to 14—27, but with no regard to the Margin.

VI. APEX,

VI. APEX. The Top or Summit, this terminates the Leaf opposite to its Infertion.

A Leaf in this Respect may be either,

38. TRUNCATUM, ABRUPT, as in the Tulip-tree. Pl. 7. Fig. 1.
39. PRÆMORSUM, BITTEN, divided at the Top into unequal Segments, as American Maple. Pl. 7. Fig. 2.
40. RETUSUM, BLUNTED, where the Top is terminated by an obtuse Sinus, as Marsh Marygold. Pl. 7. Fig. 3.
41. EMARGINATUM, NOTCHED AT THE TOP, as round-leav'd Capers. Pl. 7. Fig. 4.
42. ———— OBTUSE, EMARGINATUM, with the Notch terminated by obtuse Summits, as Tree-houseleek. Pl. 7. Fig. 5.
43. ———— ACUTE, EMARGINATUM, with the Notch terminated by acute Summits, as bifid Daisy. Pl. 7. Fig. 6.
44. OBTUSUM, OBTUSE, when the Top is the Segment of a Circle, as in Wintergreen. Pl. 7. Fig. 7.
45. ACUTUM, SHARPENED, terminated by a sharp Angle, as in One Blade. Pl. 7. Fig. 8.
46. ACUMINATUM, POINTED, when terminated by a long Awl-shaped Point, as Dwarf Arum. Pl. 7. Fig. 9.
47. OBTUSUM CUM ACUMINE, BLUNT WITH A POINT, where the Summit is obtuse, but terminates in a little sharp Point, as Stinking Orach. Pl. 7. Fig. 10.
48. CIRRHOSUM, TENDRILLED, terminated by a Tendril, as Gloriosa. Pl. 7. Fig. 11.
49. SPINOSUM, PRICKLY, the Edge running out into stiff and sharp Thorns, as Wild Acanthus. Pl. 7. Fig. 12.
50. INERME SPINOSUM, SOFT PRICKLED, the Edge terminating in soft, harmless Thorns, as Gentle-thistle. Pl. 7. Fig. 13. Inerme used without the Addition Spinofum, expresses a plain, smooth Edge.

IV. MARGO, THE MARGIN. The Divisions under this Head have no regard to the Disk or Edge of the Summit.

51. DENTATUM, TOOTHED, with horizontal Points proceeding from the Margin, of the same Consistence with the Leaf, separate and distinct, as Great Daisy. Pl. 7. Fig. 14.
52. SERRATUM, SAWED, with little sharp Angles or Teeth, placed like Tiles over one another, generally pointing towards the Top, as in Horse-mint. Pl. 7. Fig. 15.
53. ———— RETRORSUM SERRATUM, SAWED DOWNWARDS, where the Teeth point down to the Base, as in Asiatic Hoarhound. Pl. 7. Fig. 16.
54. ———— OBSOLETE SERRATUM, BLUNT SAWED, as Ballote. Pl. 7. Fig. 17.
55. ———— CREMATUM, DENTED, the Edge terminated with blunt horizontal Points, as in Wood Betony. Pl. 7. Fig. 18.
56. ———— DUPLICATO SERRATUM, SAWED DOUBLE, with lesser Teeth within the greater, as Water Hoarhound. Pl. 7. Fig. 19.
57. REPANDUM, NURLED, where the Margin is edged with little Lobes, that are so many Segments of Circles, separated by obtuse Sinuses, as Poley-mountain. Pl. 7. Fig. 20.
58. CARTILAGINEUM, EDGED, this Edge is the skinny Border of a fleshy Leaf, as Silver Sedum. Pl. 7. Fig. 21.

59. CILIATUM,

59. CILIATUM, EYELASHED, where the Leaf is furrounded by a Margin of parallel Hairs, like the Eyelash, as in ciliated Rhododendrum. Pl. 7. Fig. 22.
60. LACERUM, TORN, the Margin composed of Segments closely joined, of unequal Shape and Size, as in Succory Hawkweed. Pl. 7. Fig. 23.
61. EROSUM, GNAWED, where the Disk of the Leaf is sinuated, and other little obtuse Sinuses divide the Margin, as in Groundsell. Pl. 7. Fig. 24.
62. INTEGERIMUM, ENTIRE AT THE MARGIN, as Twyblade. Pl. 7. Fig. 25.

V. SUPERFICIES, THE SURFACE OF THE LEAF. In this respect a Leaf may be,

63. VISCIDUM, GLUTINOUS, as Henbane, Pl. 7. Fig. 26.
64. TOMENTOSUM, DOWNY, where the Hairs are hardly to be distinguished, as Common Mullein. Pl. 7. Fig. 27.
65. LANATUM, WOOLLY, covered as with a Web of woolly Matter, as Great Ironwort. Pl. 7. Fig. 28.
66. PILOSUM, HAIRY, where the Hairs are distinct, as in Mouse-ear. Pl. 7. Fig. 29.
67. HISPIDUM, BRISTLY, the Superficies spread with stiff brittle Bristles, as Bastard Hemp. Pl. 7. Fig. 30.
68. SCABRUM, RUGGED, sufficient to make the Disk of the Leaf uneven, as in wild Clary. Pl. 7. Fig. 31.
69. ACULEATUM, THORNY, with sharp cartilaginous Prickles on the Surface of the Leaf, as Indian Nightshade. Pl. 7. Fig. 32.
70. STRIATUM, STREAKED, marked lengthwise with hollow, strait Lines, as in the thick-leav'd Aloe. Pl. 7. Fig. 33.
71. PAPPILOSUM, WARTY, the Surface covered with little Bladders, as the Ice plant. Pl. 7. Fig. 34.
72. PUNCTATUM, DOTTED, with small Hollows, as dotted Aloe. Pl. 7. Fig. 35.
73. NITIDUM, SHINING, and very smooth, as if polished, as Black Briony. Pl. 7. Fig. 36.
74. PLICATUM, PLAITED, where Vessels or Nerves spread from the Base to the Edge of a Leaf, raising and falling the Disk alternately in sharp Angles, as in Lady's-Mantle. Pl. 7. Fig. 37.
75. UNDULATUM, WAVED, where the outward Part of the Disk is of a larger Circumference than a Circle can be, of the same Diameter, and becomes alternately convex and concave, as in Rhubarb. Pl. 7. Fig. 38.
76. CRISPUM, CURLED, is yet a greater Degree of Waving, laying in the Edge in circular Folds, as in curled Mallow. Pl. 7. Fig. 39.
77. RUGOSUM, FURROWED, is when the hollowed Veins are too near to admit the Substance of the Disk that then swells out, as in Sage. Pl. 7. Fig. 40.
78. CONCAVUM, HOLLOW, when the Edge is less than the Disk, and draws it in, as in Mountain Bindweed. Pl. 7. Fig. 41.
79. VENOSUM, VEINED, where the Leaf is covered with small Ramifications, as Hedge-Nettle. Pl. 7. Fig. 42.
80. NERVOSUM, NERVOUS, where simple unbranched Vessels run from the Base to the Top, as in Plantain. Pl. 7. Fig. 43.
81. COLORATUM, COLOURED, when diversified with other Colours besides Green, as Amaranth. Pl. 7. Fig. 44.
82. GLABRUM, SMOOTH, when the Surface is perfectly even, as Enchanters Nightshade. Pl. 7. Fig. 45.

VII. LATERA,

VI. LATERA, THE SIDES; and whatever appears viewing the Leaf perpendicularly.

A Leaf of a Plant may be in this respect either,

83. TERES, CYLINDRICK, tho' in this Case the Top is usually pointed, as Stone-crop. Pl. 8. Fig. 1.
84. SEMI-CYLINDRICK, HOLLOW ONLY ON ONE SIDE, flat on the other, as spotted Aloe. Pl. 8. Fig. 2.
85. TUBULOSUM, HOLLOW, as a Pipe, as the Leaf of the Onion. Pl. 8. Fig. 3.
86. CARNOSUM, FLESHY, the Membranes distant, but the Hollow filled with Pulp, as Pincushion Aloe. Pl. 8. Fig. 4.
87. COMPRESSUM, PRESSED, when pressed back at the Sides, as Indian-Colchicum. Pl. 8. Fig. 5.
88. PLANUM, PLANE, when both Sides are even, as spotted Orchis. Pl. 8. Fig. 6.
89. GIBBUM, SWOLEN, rising in some degree on both Sides, as thick-leav'd Hæmanthus. Pl. 8. Fig. 7.
90. CONVEXUM, RAISED, elevated on the upper Part of the Disk, as Orchoide Hyacinth. Pl. 8. Fig. 8.
91. CONCAVUM, HOLLOW IN THE MIDDLE, as broad Pancratium. Pl. 8. Fig. 9.
92. CANALICULATUM, FLUTED, fluted lengthways into the half of a hollow Cylinder or Cone, as Socotrine Aloe. Pl. 8. Fig. 10.
93. ENSIFORME, SWORDED, with a sharp Margin on each Side, and convex Lengthways, with an Angle, as blue Iris. Pl. 8. Fig. 11.
94. ACINACIFORME, SABRED, LANCED, the under Sides convex, the under Margin obtuse and straitened, the upper acute, as sabred Ficoides. Pl. 8. Fig. 12.
95. DOLABRIFORME, BATTLEDOOR'D, roundish, obtuse, salient and sharp above, but almost cylindrical below, as Battledoor Ficoides. Pl. 8. Fig. 13.
96. LINGUIFORME, TONGUED, linear, obtuse, fleshy, flattened, convex above, and generally with a skinny Margin, as Tongued Amaryllis. Pl. 8. Fig. 14.
97. ANCEPS, TWO-EDGED, as Cyperus-Grafs. Pl. 8. Fig. 15.
98. TRIQUETRUM, THREE-EDGED, with three flat Sides, often Awlshaped, as great Cyperus. Pl. 8. Fig. 16.
99. TRIGONUM, TRIANGLED, as the last, but the Sides Gutter-shaped, and the pointed Angles membranaceous, as Marsh Cyperus-Grafs. Pl. 8. Fig. 17.
100. SULCATUM, FURROWED, with many Angles, and obtuse Sinuses between them, as Ribbed Aloe. Pl. 8. Fig. 18.
101. CARINATUM, KEELED, or edged lengthways on the Back, as the keeled Aloe. Pl. 8. Fig. 19.
102. MEMBRANACEUM, MEMBRANACEOUS, without Pulp, as Valisneria. Pl. 8. Fig. 20.

II. COMPOSITA, COMPOUND LEAVES: when several small Leaves grow on one Leaf-Stalk, they form a compound Leaf, which is either,

103. COMPOSITUM PROPRIE DICTUM, Properly so called, where compounded but once, as Columbine. Pl. 8. Fig. 21.
104. ARTICULATUM, JOINTED, when one Leaf grows from the Top of another, as Glasswort. Pl. 8. Fig. 22.

105. **DIGITATUM, DIGITATED:** where several Leaflets, or small Leaves, grow at the End of one Stalk: strictly where more than four Leaflets are so placed, as in Dragons. Pl. 8. Fig. 23.
106. **BINATUM, PAIRED,** that is digitated with only two Leaves, as binate Bignonia. Pl. 8. Fig. 24.
107. **TERNATUM, IN THREES,** where three Leaves grow together at the End of one Leaf-Stalk: This is either,
 FOLIOLIS SESSILIBUS, where the Leaflets have no stalks of their own, as Water-Ivy. Pl. 8. Fig. 25.
 Or, **FOLIOLIS PETIOLATIS,** each Leaflet having its own Stalk, as Azorian Jasmine. Pl. 8. Fig. 26.
108. **QUINATUM, BY FIVES,** viz. five Leaflets on one common Stalk, as Lupine. Pl. 8. Fig. 27.
109. **PINNATUM, WING'D,** viz. some of the Leaflets placed on each Side of the common Stalk, like Feathers, as Goats Rue. Pl. 8. Fig. 28.
110. **PINNATUM CUM IMPARI, WINGED COMPLEAT,** the Leaf terminated by one single Leaflet, as in the Chick. Pl. 8. Fig. 29.
111. **CIRRHATUM, TENDRILL'D,** the Leaf ending in a Tendril, as Pea. Pl. 8. F. 30.
112. **ABRUPTUM, ABRUPT,** without an odd Leaf or Tendril, as Abrus. Pl. 8. Fig. 31.
113. **OPPOSITE, THE LEAFLETS PLACED OPPOSITE,** as in Saintfoin. Pl. 8. F. 32.
114. **ALTERNATIM, PLACED ALTERNATE,** as in Fraxinella. Pl. 8. Fig. 33.
115. **INTERRUPTA, THE LEAFLETS UNEQUAL,** as in Mountain Avens. Pl. 8. Fig. 34.
116. **ARTICULATE, CHAIN'D,** the Leaflets join'd to a jointed Footstalk, as jointed Vetch. Pl. 8. Fig. 35.
117. **FOLIOLIS DECURRENTIBUS, RUNNING,** the Leaflets growing down the Stalk, as decurrent Pea. Pl. 8. Fig. 36.
118. **CONJUGATIM, PAIR'D,** the former with only a pair of Leaflets, as Lathyrus. Pl. 8. Fig. 37.
119. **DECOMPOSITA, RECOMPOUND LEAVES,** these have the Leaf Stalk twice divided before it supports the Leaflet, as Red Rattle. Pl. 8. Fig. 38.
120. **DUPPLICATO TERNATUM, seu TERNATO TERNAUM, THRICE THREE'D,** is a Recomound with three Leaflets, as Barrenwort. Pl. 8. Fig. 39.
121. **BIGEMINATUM, REDOUBLED, Recomposite in Pairs,** as African Milletoe. Pl. 8. Fig. 40.
122. **DUPPLICATO PINNATUM, seu PINNATO PINNATUM, TWICE WINGED,** Recomound Pinnated, as Chervill. Pl. 8. Fig. 41.
123. **SUPRADECOMPOSITUM, THRICE WINGED, or SUPER-COMPOUND,** these have the Leaf-stalk often (at least more than twice) divided before it supports the Leaflets, as common Alexanders. Pl. 8. Fig. 42.
124. **TRIPPLICATO TERNATUM, seu TERNATO TERNATUM,** is a Super-compound with three Leaflets, as small Aralia. Pl. 8. Fig. 43.
125. **TRIPPLICATO PINNATUM, seu PINNATO PINNATUM, BRANCHED,** is a Super-compound pinnated, with pinnated Leaflets, as Candy Alexanders. Pl. 8. Fig. 44.

III. DETERMINATIO, The Determination of Leaves, consists in those Differences that distinguish Leaves without having regard to their Make, and consists of four Orders.

I. LOCUS, The Place or Part of the Plant the Leaf is fixed to.

- 126. SEMINALE, SEMINAL LEAF or COTYLEDON, as in the Turnip. Pl. 9. Fig. 1.
- 127. RADICALE, RADICAL, springing directly from the Root, as in small Bell-flower. Pl. 9. Fig. 2.
- 128. CAUDICIS, OF THE STEM, growing on the Stem, as on the Stalk of the same Plant. Pl. 9. Fig. 3. The Form of these is quite different.
- 129. RAMORUM, OF THE BRANCHES, placed on the Branches, as in Motherwort. Pl. 9. Fig. 4.
- 130. AXILLARE, OF THE WINGS, placed under the Points the Branches spring from, as in Saw-wort. Pl. 9. Fig. 5.
- 131. FLORALE, FLORAL, next the Flower, as in African Sage. Pl. 9. Fig. 6.

II. SITUS, The Situation of the Leaf with regard to the rest.

- 132. STELLATA, STELLATED, when six Leaves or more surround the Stalk in a Ring, as in Madder. Pl. 9. Fig. 7.
TERNA QUATERNA, THREE, FOUR, &c. so disposed, are also Species of the last, but their Numbers constant.
- 133. OPPOSITA, OPPOSITE LEAVES, the Stem intervening; these grow in Pairs, as in White Lychnis. Pl. 9. Fig. 8.
- 134. ALTERNA, ALTERNATE, one above another in a somewhat regular Order, as in Elychrisum. Pl. 9. Fig. 9.
- 135. SPARSA, SCATTERED, growing without any Order on the Stalk, as in Milkwort. Pl. 9. Fig. 10. When these stand very close, they are said to be,
CONFERTA, HUDDLED TOGETHER, so that their Situation cannot be perceived.
- 136. IMBRICALA, TILED, growing over one another, like Tiles, as in great Houseleek. Pl. 9. Fig. 11.
- 137. FASCICULATA, clustered, if several proceed from the same Point, as in the Larix. Pl. 9. Fig. 12.
- 138. DISTICHA, SPREAD, Leaves growing on the Branches regularly on the two Sides, as Fir. Pl. 9. Fig. 13.

III. DIRECTIO, Is the Expansion a Leaf acquires from the Base to the Summit.

I. INSERTIO, INSERTION OF THE LEAVES, viz. according to the Manner they are joined to the Stalk.

- 139. PELTATUM, SHIELDWAYS, when the Stalk is fastened to the Disk of the Leaf, as in scarlet Water-Lilly. Pl. 9. Fig. 14.
- 140. PETIOLATUM, FOOTSTALKED, is when the Stalk advances into the Margin at the Bottom of the Leaf, as in Arbutus. Pl. 9. Fig. 15.

141. SESSILE,

141. *SESSILE, SESSILE*, growing without a Stalk to the Stem or Twig, as spotted Lungwort. Pl. 9. Fig. 16.
142. *DECURRENS, RUNNING*, as in the last, but where the lower Part is extended below the Base, clinging down the Stem, as in alated Verbefina. Pl. 9. Fig. 17.
143. *AMPLEXICAULE, EMBRACING*, the Base stretching so as to surround the Stem on all Sides; this generally happens with a Sessil Heart or Arrow-shaped Leaf, as in common Thlaspi. Pl. 9. Fig. 18.
144. *SEMI-AMPLEXICAULE, HALF-SURROUNDING*, where the Lobes at the Base of the Leaf are too short to surround the Stalk entirely, as in Mithridate Mustard. Pl. 9. Fig. 19.
145. *PERFOLIATUM, PERFOLIATED*, where the Stem or Branch perforates the Disk of the Leaf without adhering to its Margin, as in Thoroughwax. Pl. 9. Fig. 20.
146. *CONNATA, UNITED*, where opposite Leaves join at the Base in one, as in Teasel. Pl. 9. Fig. 21.
147. *VAGINANS, TUBULAR*, the Base of the Leaf turning like a Cylinder round the Stem or Stalk, as in Bistort. Pl. 9. Fig. 22.
148. *ADVERSUM, ADVERSE*, where the Leaf turns its Side not upwards, but to South of the Horizon, as in the Ginger. Pl. 9. Fig. 23.
149. *OBLIQUUM, OBLIQUE*, when the Base of the Leaf rises upward but the Point turns horizontally, as in Fritillary. Pl. 9. Fig. 24.
150. *INFLEXUM, INFLECTED*, bending upwards towards the Plant, as in the Orchis. Pl. 9. Fig. 25.
151. *ADPRESSUM, PRESSED*, growing up close to the Stalk, as in common Thlaspi. Pl. 9. Fig. 26.
152. *ERECTUM, UPRIGHT*, making an acute Angle with the Perpendicular, as in narrow-leaved Catchfly. Pl. 9. Fig. 27.
153. *PATENS, SPREADING*, in an obtuse Angle from the Perpendicular, as in Brook-Lime. Pl. 9. Fig. 28.
154. *HORIZONTALIS seu PATENTISSIMUM, FLAT*, at right Angles with the Perpendicular, as in small Speedwell. Pl. 9. Fig. 29.
155. *RECLINATUM et REFLEXUM, BENDING DOWN*, so that the Top is lower than the Base, as in Tutfan. Pl. 9. Fig. 30.
156. *REVOLUTUM, CURLED DOWN*, the Summit turned like a Volute downwards, as in Sweet William. Pl. 9. Fig. 31.
157. *DEPENDENS, DROOPING*, hanging with the Point towards the Earth, as Succory. Pl. 9. Fig. 32.
158. *RADICANS, TOP-ROOTED*, the Leaf-top taking Root, as American Harts-Tongue. Pl. 9. Fig. 33.
159. *NATANS, FLOATING*, on the Surface of the Water, as Pondweed. Pl. 9. Fig. 34.
160. *DEMERSUM, DROWNED*, keeping always under Water, as Water Violet. Pl. 9. Fig. 35.

II. A TABLE of the PARTS of PLANTS subservient to their FRUCTIFICATION.

I. FLOS, the FLOWER. See Plate 10.

I. CALIX, the CUP. This is either,

1. INVOLUCRUM, the MANTLE; this surrounds several Flowers clustered together, and is most frequent in the Umbelliferæ, as in Fools Parsley. Pl. 10. Fig. 1. It is of two Kinds,
 1. UNIVERSALE, GENERAL, surrounding the Base of the whole Umbrella. Pl. 10. Fig. 1. a.
 2. PARTIALE, PARTIAL, placed under the Subdivisions of the Umbrella. Pl. 10. Fig. 1. b.
2. SPATHA, the SHEATH; this is a Film which bursts lengthwise, as in the Narcissus. Pl. 10. Fig. 2.
3. PERIANTHUM, the CUP; this is an herbaceous Cover of the Flower, and is the commonest Calix of any other. It is of three Kinds,
 1. FRUCTIFICATIONIS, of the ENTIRE FRUCTIFICATION, when it contains Chives and Germ, as in the Polyanthus. Pl. 10. Fig. 3.
 2. FLORIS, of the FLOWER, containing Chives and no Germ, as the Male Flowers of Mistletoe. Pl. 10. Fig. 4.
 3. FRUCTUS, of the FRUIT, containing the Germ and no Chives, as the Female Flowers of the Mistletoe. Pl. 10. Fig. 5.
4. AMENTUM, KATKIN-CUP. This surrounds, either wholly or in part, the Chives of those Plants that bear their Fruit in loose long Strings, as Hazle, &c. Pl. 10. Fig. 6. It is also used for the entire Katkin itself.
5. GLUMA, the HUSK or CHAFF of Corn, Grass, &c. as in the Oat. Pl. 10. Fig. 7.
6. CALYPTRA, the HOOD; this is a thin Membrane covering the Parts of Fructification: and frequently attends the Flowers of the Mosses, as upright Bryum. Pl. 10. Fig. 8.
7. VOLVA, the WHORL, the membranaceous Cup of the Mushroom Head. Pl. 10. Fig. 9.

II. CORROLA, the PETAL, as in Marvel of Peru. Pl. 10. Fig. 10.

This consists of,

1. TUBUS, the TUBE, as in the Crocus. Pl. 10. Fig. 11.
2. UNGUES, TUBE NAILS, as in Indian Cress. Pl. 10. Fig. 12.
3. LIMBUS, the BRIM or BORDER; this is the entire outer Verge, as in white Daffodill; Pl. 10. Fig. 13. and is of five Kinds.
 1. CAMPANULATUS, BELL-SHAP'D, as Canary Bellflower. Pl. 10. Fig. 14.
 2. INFUNDIBULI-FORMIS, FUNNEL-SHAP'D, as Tobacco. Pl. 10. Fig. 15.
 3. HYPERCRATERI-FORMIS, SAUCER'D, as Primrose. Pl. 10. Fig. 16.
 4. ROTATUS, WHEEL'D, as Borage. Pl. 10. Fig. 17.
 5. RINGENS, LABIATED, as Sage. Pl. 10. Fig. 18.
 6. LAMINA, the PLATE, the thin outer Part of a Flower, as in Lady-Smock. Pl. 10. Fig. 19.
 1. This is CRUCIFORMIS, CROSSED, as Rocket. Pl. 10. Fig. 20. Or,
 2. PAPILIONACEOUS, BUTTERFLY'D, as Lathyrus. Pl. 10. Fig. 21.
 7. NECTARIUM, the NECTARY, a Part distinct from all others in the Flower, as in Helleborafter. Pl. 10. Fig. 22.

III. STAMINA, the CHIVES. These consist of Threads crowned with swollen Summits, as in the Guernsey Lilly. Pl. 10. Fig. 23.

1. FILAMENTA, the THREADS, as in the Day Lilly. Pl. 10. Fig. 24.
2. ANTHERA, SUMMIT, as in Jacobæan Amaryllis. Pl. 10. Fig. 25.
3. POLLEN, the FARINA. the Powder contained in the Summits, as in sweet Pancratium. Pl. 10. Fig. 26.

IV. PISTILLUM, the POINTAL, as in the scarlet Lilly. Pl. 10. Fig. 27. This consists of three Parts.

1. GERMEN, the GERM or RUDIMENT.
2. STYLUS, the STYLE.
3. STIGMA, the BUTTON. These are shewn separate in Fig. 28.

II. FRUCTUS.

V. PERICARPIUM, Whatever covers and contains the Seeds. This may be either,

1. CAPSULA, a CAPSULE, or hollow Vessel bursting open in a regular Manner, as in Fritillary. Pl. 9. Fig. 29 and 30. This properly contains four Parts.
 1. VALVULÆ, the SIDES. Fig. 30. *a*.
 2. DISSEPIMENTA, the PARTITIONS. Fig. 30. *b*.
 3. COLUMELLA, the COLUMN, joining the Partitions and Seeds. Fig. 30. *c*.
 4. LOCULAMENTA, the CELLS, the Cavities holding the Seeds. Fig. 30. *d*.
2. SILIQUA, the SHELL, a Seed-Vessel of two regular Valves with the Seeds adhering to both the Sutures, as in Stock Julyflower. Pl. 10. Fig. 31.
3. LEGUMEN, a POD, a Seed-Vessel of two Valves, with the Seeds fixed to only one of the Sutures, as in Lupine. Pl. 10. Fig. 32.
4. CONCEPTACULUM, a COAT OF ONE PIECE, as in Hellebore. Pl. 10. Fig. 33.
5. DRUPA, the DRUPE, a single Shell coated and containing a Nut, as in the Almond. Pl. 10. Fig. 34.
6. BACCA, a BERRY, a simple Fruit with Seeds uncovered by any Shell, as in Nightshade. Pl. 10. Fig. 35.
7. POMUM, an APPLE, a Fruit containing a Capsule of Seeds, as in the common Apple. Pl. 10. Fig. 36.
8. STROBILUS, a CONE, a Fruit formed of a swelled Catkin, as the Pine Cone. Pl. 10. Fig. 37.

VI. SEMEN, a SEED, as of the Pea. Pl. 10. Fig. 38. This properly consists of six Parts. Pl. 10. Fig. 39. These are,

1. CORUCLUM, the HEART. Pl. 10. Fig. 39. *a. b*. Having its PLUMULA, PLUME, *a*. and ROSTELLUM, BEAK, *b*.
2. COTYLIDONES, PLACENTÆ, *c. c*.
3. HILUS, SCAR, *d*.
4. ARILLUS, COAT, *e*.

Some Seeds have also the CORONULA, CROWN, as Dandelion. Pl. 10.

Fig. 40. Consisting of PAPPUS the DOWN, *a*. and STIPES, SUPPORT, *b*. Others have also Wings, as Maple. Pl. 10. Fig. 41.

Some also are NUCES, NUTS, covered with a woody outer Skin, as Filberd. Pl. 10. Fig. 42. Others naked, as

PROPAGO, SHOOT, as in Mosses. Fig. 43.

III. RECEPTACULUM.

III. RECEPTACULUM, the RECEPTACLE. This is the Part which gives Infertion to the Flower; and it is either,

I. NUDUM, NAKED, as in Dandelion. Pl. 11. Fig. 1.

II. PALEACEUM, CHAFFY, as in Rudbeckia. Pl. 11. Fig. 2. And these are either,

1. FLORIS, of the FLOWER, containing the Bases of the Flowers which have no Seed, as in the Male Flower of Pompion. Pl. 11. Fig. 3.

2. FRUCTUS, of the FRUIT, as in the Female Flowers of Frogbit. Pl. 11. Fig. 4.

3. FRUCTIFICATIONIS, of the entire FRUCTIFICATION, that is, containing the Bases of Male Flowers and Fruits, as in China Aster. Pl. 11. Fig. 5.

4. SEMINUM, of the SEEDS, the Part to which the Seeds adhere within the Capsule, as in Henbane. Pl. 11. Fig. 6.

A Receptacle may also be either,

7. PROPRIUM, SINGLE, that is, which contains the Base only of one Flower, as Pasqueflower. Pl. 11. Fig. 7.

8. COMMUNE, COMPREHENDING MANY FLOWERS, as Globe-Thistle. Pl. 11. Fig. 8.

9. PALEA, the CHAFF, is a Film separating one Flower from another, as in Lepia. Pl. 11. Fig. 9.

10. UMBELLA, an UMBRELLA, a Receptacle continued in long Divisions, as in wild Parsnip. Pl. 11. Fig. 10. This is either,

11. SIMPLEX, SIMPLE, without Subdivisions, as in Shepherds Needle. Pl. 11. Fig. 11.

12. COMPOSITA, COMPOSITE, divided at the Summits into lesser Umbrella's, as Fennel. Pl. 11. Fig. 12.

13. UNIVERSALE, GENERAL, comprehending the first Shoots and Subdivisions, as in Skirret. Pl. 11. Fig. 13.

14. PARTIALE, PARTIAL, the small Umbell which rises from the Main-shoot of the larger, as in Honewort. Pl. 11. Fig. 14.

15. CYMA, a TUFT, as in Candy Tuft. Pl. 11. Fig. 15.

16. SPADIX CUM SPATHA, an EAR AND SHEATH, as in Palm. Pl. 11. Fig. 16.

A T A B L E

A T A B L E of

VARIETIES in the APPEARANCES of PLANTS arising from LUXURIANT
NOURISHMENT; or ACCIDENTS.

HAVING now gone through an examination of all the parts of Plants in their natural state, it remains only that we consider and explain a few of those singular Appearances which certain parts assume from accidents, the effect of Culture, or natural but abundant Nourishment: not that these are of Importance, like the others, in giving the distinctive marks by which one species of Plant is known from another; but merely that they may not by appearing such mislead the Student.

THE principal of these peculiarities regard the Leaves and Flowers of Plants. Those which are seen in Leaves are mostly of the Kitchen-garden products; as the curled Coleworts, and the like: such as are seen in Flowers are the produce of the great attention of the Gardner, assisted often by accidents which it is difficult to understand. These products are the double, and proliferous Flowers; to which, though they are the great delicacies of the Florist, Botany allows no better a name than Monsters.

UNDER these two kinds of Flower and Leaf Monsters are contained the great varieties; which may be thus understood.

I. OF FLOWERS.

THE Tulip when in its natural state has a Flower formed of six Petals, and furnished with six Chives: but when Culture sends up more nourishment to it; or when accident produces a Bloom before the Stalk has reached its due height, the Chives grow broad and become so many Petals; and after this, splitting flatwise once or more, they form a multitude of inner Petals, and the Tulip becomes DOUBLE. See Pl. 12. Fig. 1. This represents a double Tulip which blowed the last Season, 1759, in the Nursery Garden of Mr. LEE at HAMMERSMITH.

IN the same manner the Rose in its native wildness is single; that is, it consists only of one range of Petals surrounding a multitude of Chives: but when luxuriant nourishment is given to the Root, these Chives, as in the Tulip, spread out into Petals, in many Series: and thus the Rose becomes double, just as that Flower. But that is not the utmost effect of Luxuriance in this Instance; for the Stalk which supports this double Rose may be urged to grow through its centre, and on its top will be produced another Flower like the first; and often a Leaf between them. This is the state which is called PROLIFEROUS. See Pl. 12. Fig. 2. It represents a proliferous Rose which blowed in my Garden at WESTBOURN-GREEN 1756.

THERE is also a peculiar Monstrosity belonging to the Composite Flowers, as the Daisy, Marygold, and others; which, after they have been rendered perfectly double by the extension of their tubular Floscules in the Centre into flat and long ones like those of the Rim, send out a young Offspring from their Base. This is that species of proliferation which affords the HEN AND CHICKEN DAISY, and the CHILDRING MARYGOLD, and HAWKWEED. See Pl. 12. Fig. 3. Which represents a Hawkweed raised to extreme Luxuriance by Mr. PERFECT, Groundworker at POMFRET in YORKSHIRE, 1754.

THE Bites of Insects also will occasion mimick Flowers, and Fruit. The ROSE WILLOW is an Instance of the former; and the Galls familiarly shew the latter. The singular excrescence of the Willow resembling the Flower of a Rose, and thence distinguished by a peculiar name, is figured in Pl. 12. Fig. 4. The old Authors supposed it was a peculiar kind of Willow which bore Roses; but it is a mere accidental excrescence of the common Willow. I saw some hundreds of them a few years since on the Willows about BUGDEN; and this which is here designed from nature, is from a very fair one taken off a Willow near the seat of Sir ROGER HILL of DENHAM.

THE common Galls we use for Ink are excrescences of the Oak, produced in the very same manner as this of the Willow, by the wound of an insect; and the same Tree affords many other kinds. That which is represented, Pl. 12. Fig. 5. is what we call the Oak Apple. It is figured from a very fair one gathered on IVER HEATH in BUCKINGHAMSHIRE.

II. OF L E A V E S.

LEAVES in their first Instance of Luxuriance become curled and elevated in waves, and folds and ridges, variously, and often elegantly turned; as in the curled red Cabbage. See Pl. 12. Fig. 6.

IN the second or most extream degree their Surface rises on the Disk in bubbles, as well as at the Edge in waves; and they become then what we call *Folia bullata*; bubbled Leaves. Of this the bubbly Lettuce is an elegant instance. Pl. 12. Fig. 7.

THIS is owing to abundant Culture, and luxuriant Nourishment: and from these few plain Instances may be understood all that unnatural elegance which Plants assume from Culture.

THUS has the Reader the whole scheme of vegetable parts.

THESE last are instanced that he may be aware of them as Varieties only, when they occur in a less degree in Nature: on the others are to be founded all the distinctive characters of Plants, classic, generical, and specifick, equally. It is according to the distinctions of these, as laid down in the eleven preceding Plates, that the several kinds will be arranged in the succeeding Parts of this Work; and by the terms annexed to those distinctive marks their differences will be explained. But before we advance to the Method which is to be used in this System it will be proper that we examine the Arrangements of others.

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B O O K III.

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Of the Several ARRANGEMENTS of PLANTS.

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C H A P. I.

Of the DIFFERENT SYSTEMS of BOTANIC WRITERS.

TO form a judgment of the possibility of distributing Plants in natural Classes, it is proper to examine particularly the different Systems.

CÆSALPINUS divides Plants into Trees or Shrubs, and Herbs with Under-Shrubs. Trees form two Classes, one whose Seed has the eye on the top, the other on the bottom. The orders are taken mostly from the Fruit, or its situation with regard to the Flower; that is, either under it, or surrounded by it.

His first Class of Herbs with single Seeds, takes in most of the Apetalæ of the Moderns, to which he has added Grapes; the next the Bacciferæ, to which he adds the Melon Tribes; the third has those with single Seed-Vessels. The first order holds the Leguminous, the last the Lychnis, Alfine, and Primula Familys; with others that do not belong to them. The fourth Class is confined to the Umbelliferæ: the fifth with two Seed-Vessels, is made up of different Plants; though the last order with several Seeds comprehends most of the Siliquosæ. The sixth Class with three Seeds or Seed-vessels is extremely mixed. Of the seventh are the Bulbous, to which he has added many of the sheath'd Plants. The eighth has those with four naked Seeds. The first order, whose Seed-eye is on the top, contains the rough-leaved Plants; the second with the Eye at the bottom, the Ringentes. The ninth and tenth Classes take in the compound Plants: the eleventh has those with several naked Seeds, and is composed of the Ranunculus, Anemone, and most of the Plants which the Moderns have put under that Class; to which he has added some of the Mallows. The twelfth with several Seed-Vessels is the Multifiliquæ of the Moderns, and many of them have followed him in adding to this Class, Plants with single Seed-Vessels and several Cells. The thirteenth and last is composed of the Ferns, Mushrooms, and Mosses.

MORRISON's System is disposed into eighteen Classes.

THE four first are Trees, Shrubs, Under-Shrubs, and Climbers; to which last he adds the Melon Family. All the orders are taken from the Fruit.

THE fifth is the Leguminous: the orders are from their habit of climbing or not climbing; and the three-leaved, with what he calls their relations, as Strawberry, Tormentil, &c.

THE sixth is the Siliquose, under which title he puts several of the Multifiliquæ and Multilocares.

THE

THE 7th holds the Bulbosæ, to which he adds some plants with naked Seeds, as Anemone.

THE 8th is a strange medley of Mallows, Plants with one Seed-vessel, many pods, and Apetalæ.

THE 9th and 13th take in the compound Plants, though with many improper ones, as Valerian, Pine-Apple, &c.

THE 10th consists of Graffes with several of the sheathed Plants.

THE 12th has the Umbelliferæ joined with the Fillipendula Ulmaria, &c. and most of the Stellatæ.

THE 13th holds the Tricocæ. Two Plants, the Spurge and Ricinus compose this Class.

THE 14th, the Galeatæ and Verticillatæ, to which he adds the rough-leaved Plants.

THE 15th has the Mutifliquæ and Multicapfulares, though more properly many celled.

THE 16th, the Bacciferæ, and of those few Plants.

THE 17th, the Capillary.

THE 18th, the Heteroclite, which is a strange medley of all sorts that he could not bring into his former Classes.

THIS Author, therefore, who boasted so much of having first formed a System from Nature, owes almost every thing he has that is good to CÆSALPINE, whom he never mentions; but he has by no means kept his Classes so pure as that Author; not having one without some unnatural mixture.

RAY gave the next System; which, though borrowed greatly from the two former, and consequently founded chiefly on the Fruit, yet takes in all the other parts of plants: this author has approached nearer to Nature, and followed her also more closely than the generality of later Writers. This method begins with the smallest, and most imperfect Plants, and ends with Trees. He first divides Vegetables into Plants with Under-shrubs, and Trees with Shrubs.

OF the first he has twenty-five Classes, by him called Genera. The imperfect are in four, viz. 1. Submarinæ, 2. Fungi, 3. Musci, and 4. Capillares cum affinibus.

NEXT to these come an inferior Class of Anomalæ, without Flowers; under which are Ophioglossum, Kali, Lens, Palustris, with many of the like.

HE has such another which he calls Tetrapetalæ Anomalæ, after the Siliquosæ, where we find an odd mixture of Papaver, Tithimalus, Plantago, Ruta, &c.; and one after the Gramina: here are the Nymphæa, Tribulus, Stratiotes, Hypecoum, Epimedium, Anona, Fumaria, Piper, Thalictrum, Acriviola, &c. These were made up of Plants that would not range under his other Classes; and which he thought unconnected with the rest. DILLENIIUS has formed a new Class out of some of them, by the name of Di, and Tripelata, in the Synopsis.

RAY's 5th Class contains the Apetalæ, all well, if we except Plantago and one or two more.

THE 6th, 7th, 8th, and 9th, take in the natural orders of the Compositæ, by the names of Planipetalæ, Lactescens, Discoidæ Semine Papposo, Corymbiferæ; Fl. Discoidæ non Papposæ, and Capitata.

THE 10th, Semine Nudo Solitario, is mixed, though VALERIAN and LIMONIUM follow well the Globularia of the last. But he puts Agrimony here, which has two Seeds.

THE 11th, UMBELLIFERÆ, these are kept perfectly pure.

THE 12th, STELLATÆ, these are most naturally combined, as well as,

THE 13th, the Asperifoliae.

THE 14th, VERTICILLATAE also are excellent.

THE 15th, SEMINE NUDO POLYSPERMÆ, are the Ranunculus, Anemonies, &c. very good; so are

THE 16th, POMIFERÆ, the Melons, &c. These also are followed well by

THE 17th, which has many of the Bacciferæ, as Bryonia, Smilax, Mandragora, Solanum, &c. though I must own there are several others improperly placed there; as Vitis Idæa, Convallaria, Christaphoriana, &c.

THE 18th, the Mutifiliquæ, are all well, if we except the Apocynum, Asclepias, and Vinca: but this Class would more naturally have followed his fifteenth.

THE 19th VACULIFERÆ would have done better next the Bacciferæ, if we regard the first order of HYOSCIAMUS, NICOTIANA, &c. but if the two last which contain our Ringentes, Vasculiferæ, &c. it had been better joined to the Verticillatæ. There are in this Class several natural orders, though not connected with one another. In one of them he has oddly placed the Mallows, and joins with them the Oxalis, which is certainly related to them, but I cannot say so much of the Greek Valerian. He puts the Polygala with the Ringentes, though it is properly one of the Leguminosæ; and the Aristolochia that is a Plant sui Generis.

THE orders are all taken from the shape or figure of the Flower.

THE 20th, the Tetrapetalæ Siliquosæ and Siliculosæ are extremely well, and perfectly chaste.

THE 21st, the Leguminosæ are the same.

THE 22d, the Pentapetalæ Vasculiferæ are mostly well; containing the Caryophyllacei, the Alfine, Hypericums, Saxifragas, Geraniums, &c. The last order has no business here; containing Viola Refeda and Impatiens. DILLENIIUS has formed another class here of some of the Anomalæ; as Lythrum, Nymphæa, Peplis, calling them Polypetalæ.

THE 23d, holds the Bulbosæ and Affines, all perfectly well: the Affines are the Orchidææ and several of those Plants which will be found under the term Spathacei in our succeeding natural method; only Cyclamen seems improper among them.

THE 24th, are the Gramina.

I CANNOT commend his Classes of Trees.

THE 25th, Arundinaceæ or Palmæ.

THE 26th, Apetalæ, where he has mixed the Ruscus and Empetrum with otherwise a good Class of the Amentacei.

THE 28th, FRUCTU Umblicato, and non Umblicato. The Plants in these two Classes are greatly (and some terribly) separated; the Pyrus, Mespilus, Rosa, Ribes, &c. are placed together in one, though they differ greatly; Prunus, Cerasus, Padus, in the other.

THE 29th, ARBORES FRUCTU Sicco has only the Acer and Fraxinus in the first order; the last are extremely mixed.

THE 30th, SILIQUOSÆ seem well; he keeps by themselves the Cassia, Tamarindus, &c. that have not a papilionaceous Flower.

THE 31st is reserved for the Ficus.

As I affirm this Author to have followed Nature more than any other, it will be worth while to show in a few words, his faults as they appear to me, and his superior merit.

Here

Here I must observe, in general, that though he has made natural Classes, he did not take sufficient Pains to join them naturally: his System prevented that in some; but others might easily have been better ranged together.

His nine first Classes seem all good, the 5th is mixed a little, and so is the 11th, and the five following. Most part of the 18th is very well, the 20th and 21st are excellent, the 23d and 24th very well. There remain only for the much mixed Classes the 10th, 17th, and 19th; and even in these there are excellent orders.

THE Bacciferous appears to be one of the worst: two Classes of his Trees are good, and the two last, though with a few improper Plants. LINNÆUS thinks fit to allow him but twelve natural Classes; the rest he calls extremely mixed: but is this fair? Shall two or three improper Plants make us condemn an otherwise natural order? Let it be said to this worthy Man's praise, that wherever the best Authors have attempted natural Classes, they plainly follow his footsteps, tho' they have not ingenuity enough to own it. I am sure the more I study the Book of Nature, the higher opinion I conceive of RAY. His fault was tying himself down too rigidly to a system, which separated his Classes. It were well if succeeding Authors erred only this way; but they, as we shall soon see, flounced, deeper: many not only separated their Classes, but their Genuses too. True it is, that RAY's Genuses and Species are not sufficiently described: this task was reserved for that excellent Botanist LINNÆUS; and is his master-piece. Yet I must express a wish, that in his specific descriptions he had followed a little more our worthy Countryman. LINNÆUS's conciseness is productive of as much confusion as RAY's prolixity. I am sorry to be forced to own before I quit this learned Man, that he did not sufficiently acknowledge the assistance he had from MORRISON. We may easily trace in him many of that Author's Classes, though greatly improved. It would in no wise have lessened his merit to have named his Author; and, though perhaps MORRISON complained with too much virulence; it was not without foundation. But these are trifling imperfections, to which the best of Men are subject; let them be forgot: and as I have pointed both the good and the bad of this Author, it will not be difficult to avoid the one, whilst we reap the fruit of his labours by carefully examining the other.

HERMAN's method was published by one of his Scholars in 1690, and is taken solely from the Fruit. It is intirely artificial; Nature is little attended to, except in the natural Classes, kept by most authors. The others are formed of many various Plants; and as it is chiefly compiled from CÆSALPINUS and MORRISON, it will be unnecessary to dwell longer upon it.

RIVINUS was cotemporary with RAY and HERMAN: he had very bitter disputes with the former about his System, which RAY very properly condemned. This Author is remarkable for having dropped the distinction between Trees, &c. and Herbs: he also mixes the Apetalæ amongst the rest. He divides Plants into perfect and imperfect: the first into simple and compound, the simple into regular and irregular; the regular form seven Classes, viz. the 1, 2, 3, 4, 5, 6, and many Petal'd: the irregular the same. Of the compound he has regular and irregular; and regular and irregular mixed. The imperfect make the 18th Class. His orders are taken from the Fruit. He has not one pure Class; for though he keeps many of the Plants together that form the best natural Classes, as the Umbeliferæ, Compositæ, Rihgentes, &c.; they have very improper ones joined to them. The following instances prove this assertion.

IN the regular, Tetrapetalous in the midst of the Siliquosæ, are placed Potamogiton, Clematis, Epimedium, &c. and there are added Euonymus, Laurus, Vaccinium. To his regular compound Class is added Nymphæa: to his regular and irregular, Granadilla, Nigella, Helleborus, &c. His irregular compound are the best, but far from well. In his irregular Monopetalous, with the Ringentes are Lobelia, Aristolochia, Lantana, Lonicera, Arum, &c. With the Leguminosæ: in the regular Tetrapetalous appear Iberis, Cardispermum, Impatiens, Euphorbia, &c. Joined to the Umbelliferæ in the irregular Pentapetalous are Tropæolum, Geranium, Cassia, and several of the Multifiliquæ. In the imperfect, you find Equisetum and Ricinus: in the middle of the Amentaceæ, Ficus, with Triticum, &c. In the second Class there is only the Circeæ; in the 12th, two Malabar Plants; in the 13th and 17th none. This, with the coining many new names, is all very bad; but nothing to the confusion that arises in the Genera from this distribution; many of which are terribly broke and divided; those preserved, it is no great matter how an artificial System is formed: it is an Index, and little more. However, this has had many admirers, among whom RUPPIUS, KNAUT, and LUDWIG have corrected and embellished it much: the last has kept the Class of the Apetalæ, but calls it by the strange name of Dubii. This Author published, in 1747, a new method, wherein most of RIVINUS's Classes are kept: he there calls this Class Apetalæ: he makes no distinction between the regular and irregular, in the Diapetalous, Tripetalous, and Hexapetalous; but adds two new Classes from those unnatural ones, the Monæciæ and Diæciæ of LINNÆUS; which he calls Relativæ Mono, and Diphytæ. His orders are taken from the Chives and Pointal: His generical descriptions are good, but generally borrowed from LINNÆUS; so are many of his names. Upon the whole, many of the natural Classes are pure; but yet the foundation of this method will not admit of any approach to Nature.

TOURNEFORT was another competitor of RAY's, and one of the most accurate Botanists of the age: he examined more Plants than most people had done before him, or have indeed ever been able to do since. He studied Nature, yet preferred the arbitrary Laws of a favourite System; so that notwithstanding he has many Classes tolerably natural, his orders are often excellent, and the Plants well ranged under them, it still must pass for an arbitrary method. His distinctions of the shapes of Flowers render it also very difficult. His generical descriptions, though not perfect, are rendered tolerable by his Figures; and indeed before him we had hardly any to be depended on. His System consists of twenty-two Classes: he divides all into Herbs and Trees; the former into Petalous or Apetalous; the Petalous into simple and compound; the simple into Monopetalous and Polipetalous, and each of these into regular and irregular. His orders are taken from the Fruit, and what he calls the Pointal, or Cup going into Fruit, which answers to the Fruit, being above the Cup or below it.

HIS 1st Class, Campaniformes, contains some good orders, but not connected with one another, as the Mallows, Cucurbitaceæ and Stellatæ. Part of our Folliculaciæ militate here; others in the next; Campanula and Ranunculus are placed with the Stellatæ; and there are several Species here that by no means suit his classical character. The other orders are extremely mixed.

2d, INFUNDIBULIFORMES, of these the Primulæ are tolerably well, and several of the Solanacei of our natural method; some are in the last Class. The Ipomæa and Trachelium are totally separated; many of their companions are in the Campiformes. Mirabilis, Verbascum, and Hyoscyamus are divided; and several of their Relations, as Mandragora, &c. are placed among the Campaniformes. The Crucianella is placed here, instead of being with the Stellatæ. The purest order contains the rough-leaved Plants, tho' one of them, Cerinthe,

is

is in the last Class. Upon the whole, these two Classes are extremely mixed, and yet by selecting Plants out of each, several natural orders might be made.

3d, MONOPETALI ANOMALI, if it were not for two or three small orders, with Arum, Aristolochia, Tithimalus, &c. this would be an excellent Class; though with a wretched title. It contains the capsulated Ringentes of our natural method.

4th, LABIATI; this is excellent, consisting of the naked Ringentes. They are ill placed, but none improper.

5th, CRUCIFORMES; this is also extremely well; though in the latter orders he has thrust in Hypecoum, Chelidonium, Epimedium, Potomageton, and Paris.

6th, ROSACEI; the first order of this long Class contains the Amaranthus and Portulaca: the five next are composed of the Multifiliquæ and Quinque-loculares, as the Alfinæ, Sedums, &c. but extremely mixed: then follow the Gymnopolyspermæ, Anemones, &c. and the next order contains several Bacciferæ, as Asparagus, Smilax, &c. The two last are mixed, tho' with less impropriety.

7th, THE Umbelliferæ, very well, though I dislike the Eryngium with them.

8th, THE Caryophyllacei; this is very short, and joins to the Lychnis's, Linum, and Statice.

9th, LILLEACEI; this Class is very good: I think the Monopetali answer better to his Campaniformes, though he did right in keeping them with their companions.

10th. PAPILIONACEOUS, very pure.

11th, POLYPETALI ANOMALI; this is extremely mixed: it begins with Viola, Balsamine, and Fumaria: then follow ten or twelve of the Multifiliquæ, to which he adds Polygala; and the last order takes in the Orchidea, ending with the Musa.

12th, 13th, 14th, THE three Classes of the Compositi, Flosculosi, and Semiflosculosi are very natural; though perhaps these divisions do not always hold good.

15th, APETALI; in the middle of the common apetalous Plants he places the Gramina.

16th, FLORE CARENTES; these are the Ferns, to which he adds Lichen.

17th, FLORE ET FRUCTU CARENTES; take in the Musci and Algæ.

T R E E S.

18th, APETALE.

19th, AMENTACEÆ.

20th, MONOPETALÆ.

21st, ROSACEÆ.

22d, PAPILIONACEÆ.

THE Trees are extremely mixed, except the 19th Class and the last; some of the 18th belonging to the Amentaceæ: as for the rest, they have no other connection than in the titles of the Classes.

PONTEDERUS and some others followed; who joined TOURNEFORT and RIVINUS.

BOERHAAVE, in 1720, published a System, in which, tho' mostly founded on HERMAN's method of the Fruit, yet he follows TOURNEFORT and RAY in many other things; so that is considered as a sort of weaving of these three Systems. His Classes of Shrubs are almost all defined from the Fruit, which prevents his approaching Nature so nearly as RAY has done: however,

however, in some things, he excelled all that went before him; as in his generical characters, which, though taken from *TOURNEFORT*'s, are greatly preferable; for he makes use of more parts of the Fructification in his descriptions. He also first examined the number and disposition of the Chives. He divides his System into Herbs and Trees; yet wherever he found Trees naturally connected with Herbs, as in the *Leguminosæ*, *Triocceæ*, &c. he avoided separating them. An excellent method, and almost peculiar to himself. He begins, like *RAY*, with the imperfect Plants, and then divides, with him, both Herbs and Trees into *Monocotyledones* and *Dicotyledones*.

His 1st, 2d, 3d, are three Classes of imperfect Plants: *Submarinæ Terrestres*, and *Capillares*.

4th, *THE Gymnopolyspermæ*, the *Anemone* tribe, a very natural Class.

5th, *GYMNODISPERMÆ*, the *Umbelliferæ*, very pure.

6th, *GYMNOMONOSPERMÆ SIMPLICES*, a short Class of the *Valerians*, *Agrimony*, and other *Coronatæ*, that seem well placed after the *Umbelliferæ*; though I cannot say all are well connected here.

7th, 8th, 9th, 10th, *THE Gymnomonospermæ Compositæ* are divided into four Classes; *Planipetalæ*, *Discifloræ Radiatæ*, *Discifloræ Nudæ*, *Capitatæ*. These are perfectly pure, tho' some Species of his *Discifloræ* will be radiated, others naked in the same Genus.

11th, *GYMNODISPERMÆ STELLATÆ*. This natural short Class should have followed the *Umbelliferæ* with the *Coronatæ*.

12th, *GYMNOTETRASPERMÆ VERTICILLATÆ*, the *Ringentes*, very pure. So is the

13th, *GYMNOTETRASPERMÆ ASPERIFOLIÆ*.

14th, *GYMNOTETRASPERMÆ TETRAPETALÆ*. This contains only the *Potamageton*.

15th, *MONANGIÆ*, composed of two good orders, the *Primula* and *Lichynis*'s.

16th, *DIANGIÆ*; this begins with *Lythrum* and *Saxifrage*, followed by the rest of our *Ringentes Capsulatæ*.

17th, *TRIANGIÆ*; the first order mixed with many *Campanaceæ* and *Quinqueloculares*, as *Hypericum*, and *Parnassia*; and some *Multifiliquæ*, as *Refeda*: the others are *Triocceæ*, to which he adds *Cardiaspermum*.

18th, *TETRANGIÆ* contains only *Ruta*, *Peganum*, and *Stramonium*.

19th, *PENTANGIÆ*, the *Geranii*.

20th, *POLYANGIÆ*, are mixed; as the *Mallows*, with *Nymphæa*, &c. *Nigella*, and some of its Relations, with *Cistus*.

21st, *MULTISILIQUÆ* is very well, and follows naturally the end of the last Class.

22d, *SILIKUOSÆ*, extremely mixed, taking in all filiquous Plants that have have not cross-shaped Flowers, as *Chelidonium*, *Fumaria*, *Apocynum*, *Zygophyllum*, &c. but the third order is very good, containing those Plants distinguished by two Follicles, which in our succeeding natural method we shall call the *Bifolliculares*.

23d, *TETRAPETALÆ CRUCIFORMES*, very pure.

24th, *LEGUMINOSÆ*, very good, though some of the last orders with separate Chives, should not be placed with the rest in a natural method.

25th, *BACCIFERÆ*; this is like *RAY*'s, containing several related Plants, and many unconnected.

26th,

26th, POMIFERÆ; this would have followed well the last Class, if he had ended with the Bryonia, &c. It consists of the Cucurbitaceæ, though he adds Cactus and Bromelia.

27th, APETALÆ; generally very well.

28th, MONOCOTYLEDONES BRACTEATÆ; this Class also is well, though I do not approve of his orders: he joins many of our Spathaceæ and Orchideæ to the Bulbosæ.

29th, MONOCOTYLEDONES APETALÆ, the Gramina and but few of them.

A R B O R E S.

30th, MONOCOTYLEDONES, the Palmæ with Musa.

31st, APETALÆ.

32d, AMENTACEÆ.

33d, MONOPETALÆ.

34th, ROSACEÆ.

He ranges his Trees pretty much like TOURNEFORT; the 30th and 32d Classes are good; all the rest are greatly mixed, though his orders are purer: thus in his last Class, his 6th and 7th orders contain almost all the Fruit Trees of our natural Classes the Coronatæ and Calycanthæ, very well.

MAGNOL published his System at the same time with BOERHAAVE: and it is totally different from all that went before him. He takes his classical characters from the Cup: and as some Plants have none, and yet his System makes one absolutely necessary, he has established three great divisions.

1st, AN external Cup only, which is the true one, and answers to the Gymnopolyspermæ.

2dly, AN internal Cup only; this is really the Capsula; so it takes in the Angiospermæ without Cups, such as the Lilliacæ.

3dly, EXTERNAL and internal together; this comprehends the rest of the Angiospermæ. He takes his orders from Cup, Flower, and Fruit, but chiefly from the Flower. We shall very slightly examine his System, by which its merit will easily appear.

1st CLASS, Calice Externo, Flore Ignoto. A very few Algæ, Ferns and Mosses.

2d, CALICE Externo, Fl. Stamineo. A few Apetalæ and Gramina.

3d, CALICE Externo, Includente Florem Monopetalum. This is no bad Class; it begins with the Asperifoliæ, and ends with the Ringentes Nudæ.

4th, ----- Florem Polypetalum. A few of the Gymnopolyspermæ with Urtica, Kali, &c.

5th, ----- Florem Compositum, he here takes TOURNEFORT's Radiatæ, Flore Flosculari et Semiflosculari Simul. this is very well: but he joins Valerian, Scabious, Eryngium, Statice, &c.

6th, CALICE Externo Sustinente Florem Monopetalum. The Stellatæ, with many other different Plants, as the Lapatha, Sanguisorbæ, &c.

7th, ----- Florem Polypetalum. Umbelliferæ; very well if he had not joined Anemone, Pulsatilla, and Clematis.

8th, CALICE solum Interno; the two first orders contain the Lilliacæ and some of the Orchideæ; the last a strange medley of Bacciferæ, Tricocceæ, and Multifiliquæ.

9th, CALICE Externo et Interno Monopetalæ. The three first orders of this Class do tolerably; they contain the Solanaceæ, Cucurbitaceæ, many of the Campanaceæ, Primulæ, &c. The fifth has the Mallows, with some Bifolliculares added. The sixth, many of the Ringentes Angiospermæ.

10th, CALICE Externo & Interno, di vel Tripetalæ. Only Circæa and Tradescantia.

11th, ----- Tetrapetalæ. The Siliquosæ would be very well here, if they had not been preceded by Paris, Capparis, and Ruta; and followed by Hypecoum, Epilobium, &c.

12th, ----- Polypetalæ. The three first orders contain many of the Quinque-loculares, Multifiliquæ, Alfinæ, and Lychnis's: the last are the Leguminosæ.

13th, ARBORES Calice Externo; mostly amentaceous.

14th, ----- Interno; mixed.

15th, ----- Externo & Interno; immensely mixed.

LINNÆUS, in 1737, was the next Author that produced a System. He has given us one from the Cup improved from MAGNOL; where the shape, situation, and segments of it form the Classes, and many of the orders. But as in treating of the parts of Fructification all his distinctions have been explained, it will be needless to run over this System at present. The Author himself allows it to be entirely artificial. I must however observe, that ROYEN, whose method we shall soon examine, has taken from it three Classes, viz. Palmæ, Calycifloræ, and Coronatrices.

We have now seen methods of ranging Plants taken from the Seeds, from the number of Petals or Segments in the Flower, and from the Cup. Some of these also have been combined: and yet amongst them all RAY's only approaches to Nature. The parts of Fructification yet remaining are the Chives and Pointal: these LINNÆUS has made use of, to form his sexual System. He allows no distinction between Trees and Herbs; his Classes are taken from the number of Chives; and his Orders from the Pointal. Had he stopped here, his System would have had few admirers; for it is very artificial, and subject to uncertainty from the varying of the number of Chives, and even of Sex in the same Genera. It demands also great attention; and in small Flowers, magnifying Glasses. Some Classes are terribly torn asunder, and others strangely mixed. But his great and well merited Reputation does not proceed from his System: he certainly has advanced the study of Botany more in a few Years, than many Ages had done before. He had great assistance from those who preceded him: but besides many things peculiar to himself, the very distribution of the old materials, and making use of them as he has done, shows that superior Genius which, in spite of some imperfections, forces our admiration and commands our praise.

HIS CRITICA BOTANICA lays down many excellent rules for the distributing Plants into their true Classes, Genera, and Species; and for characterizing properly each of these divisions. Many are the rules also relating to the names of Plants; but these I cannot equally commend: some indeed are unexceptionable, but others trifling and unnecessary; yet in consequence of them, how many alterations has he made? How has he, instead of diminishing, added to the incertitude of that disagreeable part of Botany? Why are all names given Plants by unskilful people, taken from Gods, or not Greek and Latin, to be rejected? How trifling are his reasons! and how much more weighty are the objections to be made to some of his innovations! as where the Greek and Latin names, having the same sense, are given to two distinct Genera; where the Greek or Latin names of particular Plants are taken from them
and

and applied to new or very different Genera. What an inundation of Swedish names has he brought into Botany! unknown, unheard of out of their own country, perhaps out of their province; while he rejects others that have been given out of respect to great and eminent men! Why, for example, must CATESBY's *Meadia* be called *Dodecatheon*. Few men were better known than Dr. MEAD; few patronized Learning more, and Botany in particular. The truth is, many of these rules were very proper for the infancy of Botany; but such great alterations, in things established by long custom, are ever attended with confusion; nor ought to be attempted without the most pressing necessity; which is far from being generally the case. We formerly took notice of BOERHAAVE's having much improved TOURNEFORT's generical characters; LINNÆUS, by taking in the whole Fructification, has established them. His characters were the first to be depended on: all was uncertainty before. They are general, and may be adapted to all Systems; new discovered Genera can only add to them; new Species will not alter them.

HERE then is one immense improvement: the following, his distinction of Species, is fully equal to it; but with this remarkable difference, that here our Author had no assistance; for no writer before him gave a true specific character. The different colours of Flowers, the Country the Plants came from, as *Dictamnus Montis Sypili*; the names of their first discoverers, as *Samolus Valerandi*; the situation they were found in, as *Eryngium Montanum*, &c. the vague words of Major, Minor, &c. as *Centaurium majus* and *minus*, were the only terms made use of to describe the Species. BAUHINE, RAY, and older Writers gave indeed long descriptions in their natural Histories of each Plant; but these cannot be called specific characters: LINNÆUS alone has the honour of first framing them; and they are made with great penetration: I cannot say they are equal to his Genera, the thing will not admit of it; a new Species will often make some alteration in those described before: besides, who has seen all the Species he describes? much must be taken on trust, and we are often led into error by very able men.

I INDEED wish that LINNÆUS had joined a short account of the habit and manner of growing, place of the Flowers, &c. of each Species; two or three lines would have been sufficient, and it was the more necessary, as he has mixed Trees and Herbs. However, in his new SPECIES PLANTARUM, he adds a mark to distinguish annual, perennial, and shrubby Plants.

PLUMIER has been equally remiss; and neither BOERHAAVE nor TOURNEFORT have given us any description of the Habits of Plants.

IF to all these improvements of LINNÆUS we add the many new parts of Vegetables he has described (for I must call those so that no one formerly regarded) as the Nectarium, the Stigma, the Conceptaculum; the fixing a determined sense to the terms Valves, Cells, and many other parts of the Fructification, that were hardly ever used to signify the same thing before him; the accurate divisions of the Buds, Leaves, Branches, &c. I say, if all these, and many more excellent things that occur in his numerous volumes are examined, we shall not be thought to neglect the living or do injustice to the dead, by affirming him to be the greatest Botanist that ever any age produced. Should I, after what has been said, treat his System with great freedom, let me not be suspected of any desire to lessen his fame; I have myself assisted to establish it: whatever fate attends the one, the other will remain while Botany is cultivated: he does not pretend it as a natural method: I cannot commend it as an artificial one; for innumerable are the exceptions to his classical characters, &c. I shall not examine it minutely, nor take notice of every Plant that disagrees with the title it stands under; some few general observations will be sufficient. His best Classes are these:

DIDYNAMIA, where *Melianthus* is the only Plant unnaturally placed: but then there are those wanting, that are in this *Diandria*, which quite ruins this natural Class.

TETRA-

TETRADYNNAMIA. The Siliquosæ; are pure, if we except Cleome. So are

MONADELPHIA. The MALVACEÆ; as also the

DIADELPHIA, or Papilionaceæ; and the

SYNGENESIA; the last order excepted. But then his method of dividing this last Class, according to the Sex, is terrible. In the Polygamia Superflua, there are Species of the Gnaphalium, that belong to the Polygamia Æqualis, others to his Class of Dioicia: and of the Tuffilago, some Species are Androgynæ. But indeed, nothing renders this System so unnatural, or so uncertain, as the dividing the Plants, into Sexes; which will appear more hereafter.

ICOSANDRIA seem pretty natural.

GYNANDRIA: the first order of this Class, containing our ORCHIDEA, is very well: but the others render it artificial. Of the remaining Classes. The

MONANDRIA contain some of the Spathaceæ.

TRIANDRIA are a mixture of the Bulbosæ, Tricoccæ, Coronatæ, Gramina, &c. and the Valerians there have an equal Right to four or five different Classes. The

TETRANDRIA have some of the Aggregatæ, Stellatæ, &c. In the

PENTANDRIA are the Asperifoliæ, Primulæ, many of the Campanulæ, and all our Bifoliales; with many other different Plants: and among the rest the Umbelliferæ, which natural order will also show the impropriety of his sexual method; for numbers of them, especially those with large and thick Seeds, belong to his Polygamia. Why should I mention the Lapathums, Atriplex, Rhamnus, Laurus, Amaranthus, Blitum, Carex, Lychnis, Papaia, &c. that have all Species with Flowers of different Sexes? Bryonies are Monæcia, Dioecia, Androgynæ; and some Veratrums are of both Sexes. The

HEXANDRIA contain many of the Bulbosæ, with others. In the

DECANDRIA are mixed the Alfinæ and Lychnis's. In the

POLYANDRIA are a few of the Multifiliquæ; in short, the Cucurbitaceæ, Apetalæ, Gramina, Amentaceæ, Trioccæ, are cruelly divided, many are in his Diocia, Monæcia, Polygamia. In the first of these are several Genus's with hermaphrodite Species, as Fraxinus, Urtica, Salix, Aruncus, Spinachia. How many more Species have I omitted, that belong to other Classes, rather than those they rank under? Upon the whole, he has not kept the natural orders near so pure as RAY and BOERHAAVE, and many are totally destroyed. But waving that, and taking it only in the light of an artificial System, the innumerable exceptions we meet with in Plants differing from their Classes, renders it, in my opinion, very intricate and very uncertain. But still he has great merit, even here; as in the excellent whole characteristics of the Compositæ, Papilionaceæ, Siliquosæ, Malvaceæ, and the Orchideæ, which are formed to continue lasting marks of these natural Families; and, indeed, I may say as much of the Ringentes if we add the two-chive Plants to his Tetradynamia. To this and his characters we must attribute the astonishing success his System has had: in spite of all the prejudice, the envy and malice of its opposers, in spite of all its faults, many eminent Botanists have received it, and all have new modelled their Systems by this Author's observations: if some correct him, they are manifestly assisted by the weapons he himself has provided for them.

THE two remaining methods we shall now examine, are built upon his foundations. The first is ROYEN's, printed in 1740. He has laudably endeavoured to keep the natural Classes together

together as much as possible; and for that reason, many of his Plants differ from their claf-fical character. Far from blaming him in this, I wish he had made free with more; but I find great fault with his taking no manner of notice of it himself. He has given us only the Species; and refers to LINNÆUS for the description of the Genera: how, therefore, is it possible to discover where he has placed any of these Plants that do not agree to the character of their Clafs? This is a great defect; but we must not be too severe: for except the distribution of some of the Clafses and Orders produced from his own observations, his specific characters are generally LINNÆUS's; and though he talks of having examined them, he has servilely copied them with all their faults. Some of these, his master (by altering them) has since acknowledged. He has taken, very properly, the characters of his great divisions from all parts of the Fructification: his orders depend chiefly on the Flower. As this method was only intended for the LEYDEN Plants, numbers are wanting in it; some of which would have much distressed his System. GMELIN is encreasing this System with the Plants of SIBERIA.

ROYEN distinguishes Plants into Monocotyledones and Dicotyledones.

MONOCOTYLEDONES, his first Clafs, contains the

PALMÆ, which, as I said before, is in LINNÆUS's methodus Calycina. I own I think it, if not natural, yet made up of many good and natural orders; which, however, he has sometimes disturbed.

LILLIA makes the second; this also is a good Clafs; tho' perhaps it would have been better without the last order.

GRAMINEÆ, very pure.

AMENTACEÆ, as also this: tho' I should scruple to place here Xanthium, Ambrosia, and Parthenium: they differ too much in habit from the rest, notwithstanding their amentum. Hitherto the Clafses have followed one another very properly, but I cannot say so of the

UMBELLIFERÆ, though it is an excellent order.

COMPOSITÆ, the Compound, well placed, and unexceptionable.

AGGREGATÆ, are highly proper: not that I approve however of all the Plants; as Dorstenia, &c.

TRICOCCÆ; this has no connection with the last. It is very well: but several of the Plants do not suit the character.

INCOMPLETÆ; here are many Plants of the Apetalæ well placed; others very improperly occasioned indeed by his mixing the Trees.

FRUCTIFLOREÆ; this is the Coronatrics of LINNÆUS's methodus Calycina. It is by no means a bad Clafs, though it follows ill the last. The Campanulæ are very improper here; they belong to another of his clafses, though the character of that would not admit them. Cliffortia and Aristolochia are ill placed; and Linnæa is a Ringens.

CALYCIFLOREÆ; this is the Floribundæ of LINNÆUS, and comes properly after the last: for the female Plants of the Cucurbitaceæ that form the first order here, belong to the Fructifloræ. The second, third, and fourth orders are taken from the Icosandria of LINNÆUS, and agree well together; but have nothing to do with the first or last order, which takes in the Cactus, Pereskia, and Mesembryanthemum.

RINGENTES; this Clafs is excellent, but has no affinity with any near it.

SILIVOSÆ; this is precisely in the same case, and so are the

COLUMNIFERÆ, the Malvaceæ.

LEGUMINOSÆ, and this natural Class. None of these, as they are placed, have the least connection with one another.

OLIGANTHERÆ. Now we come to the three mixed Classes of this author; in which are excellent orders interspersed with others, containing very different Plants. Here is certainly an improvement on LINNÆUS, who, by keeping to the number of the Chives, separated Plants strangely. ROYEN saw that their proportion to the number of Petals or of Segments in the Monopetalæ, would be more favourable to Nature: accordingly he put into this Class all Plants, whose Petals or Segments equal or exceed the number of their Chives. So that we have here many of LINNÆUS's first five Classes, but chiefly, his fifth; the Asperifoliæ are kept pure in the fourth order; our Bifolliculares in the fifth; in the sixth are many of the Primulæ, tho' with a mixture of foreign Plants, as Amaranthus, Parnassia, &c. in the seventh are several of the Solanaceæ, and next them some of the Campanulæ; others are in his Fructifloræ. The rest of this order, with the two last, are mixed.

DIPLOSANTHERÆ; this Class comprehends all those Plants whose Chives exceed, as far as a double proportion, their Petals; and takes in most of LINNÆUS's oct. dec. and dodecandrias. The first order has the Arbutus, and its associates; the second and third, the Lychnis's, Alines, and some few of the Multifiliquæ; all very tolerably. The last order is composed chiefly of Trees. The Polyantheræ is the same with LINNÆUS's Polyanthia; and, like that, has a great mixture of Plants, though the Multifiliquæ stand well together.

CRYPTANTHERÆ take in a few of the Filices, Musci, Algæ, and Fungi.

LASTLY, the LITHOPHYTA the stony Plants.

THIS is the disposition of ROYEN. Let us Sum up in a few words our opinion of it. He has got together many natural Classes, and in his mixed ones are several good orders; but in doing this, he has not so much followed Nature as other men's observations; from hence proceed his faults. He has little studied to connect one Class with another: his Orders, and his Genus's are too often liable to the same defect. The numerous exceptions to his general characters have been mentioned before.

HALLER writ about the same time, though his work did not appear till a year after. Many of his Classes are the same with RAY's, but finished in a very different manner, with great knowledge and a vast store of natural observations. His method is not general, any more than ROYEN's, but confined to the Plants of SWITZERLAND. I cannot approve of the length of some of his Classes; for there are two, the Apetalæ and Isostemones, that include almost half his Genera; and we shall multiply his classes too much, by giving that name to his orders. Besides, they often contain but one or two Plants. All this will better appear on examining his System.

1st, His first Class contains Plantæ Floribus destitutæ; these are the Algæ and Fungi.

2d, THEN those Flore aliquo donatæ; under which are the musci and Filices.

3d, APETALÆ; this begins with the Amentaceæ. The first Plant is Ephedra, following well the Equisetum of the last Class: his next great order is the Non Juliferæ Isostemones, which negative character I am not fond of. Then the Meiostemones diplostemones, and Polystemones: these all contain the Apetalæ of authors, with many trees and several of the old Bacciferæ.

IN

IN the next order are the Aquaticæ, placed well before the Gramina, that ought to have formed a Class by themselves. The last order is the Graminibus adfines, as the Carex, Juncus, Typha, ending with Arum. The

4th, PETALODEÆ MONOCOTYLEDONES; the first great order comprehends the Orchideæ; the next, the Liliacæ. Then follows the second great division of the Petalodeæ, the Dicotyledones, beginning,

5th, WITH the POLYSTEMONES.

THIS Class is divided into Multifiliquæ, Gymnopolispermæ, Calicanthemi, Pomiferæ, Multiloculares, and Malvæ. All here are put well together, though with many Exceptions. The Multifiliquæ in particular have all our Pileati. Numbers of them, however, do not suit the classical character: but HALLER freely prefers Nature to the arbitrary laws of his own System.

6th, DIPLOSTEMONES is joined to the last extremely well, by Oxys and Geranium, which begin the Class, followed by the Lychnis's, Alfinæ, and Bicornes; though betwixt these two there are Agrimonia, Epilobium, Ruta, &c. much better elsewhere. He ends this with Acer, which has no connection with the rest, tho' it joins well to Staphyllodendron, the first Plant of the

7th CLASS, ISOSTEMONES; which Class is divided into, 1. Coronatæ, where we see Staphyllodendron, Euonymus, and Berberis, placed before the Umbelliferæ; to these are more properly added the Circæa, the Tetrapetaloides or Stellatæ, and the Quinquifidæ; as Opulus, Viburnum, &c.

THE second great order are Flore circa Fructum Posito; comprehending the Primulæ, Campanulæ, Solanacæ, Asperifolia, and our Bifolliculares; as in ROYEN's Oligantheræ, but digested in a much more natural manner.

8th, MEIOSTEMONES; there are only two Plants put under this title, Ligustrum and Veronica. I am surprized he chose to separate them from the Isostemones, though they have fewer Chives than Petal-segments.

9th, STAMINA AD PETALA SESQUIALTERA; these are the SILIQUOSÆ, kept very pure.

10th, STAMINA AD PETALA DUPLO SESQUITERTIA; the Leguminosæ beginning with Astragalus, and ending with Polygala and Fumaria, which he calls Papilionaceis affines: followed very naturally by the

11th, STAMINA QUATUOR INEQUALES, or our Ringentes Capfulatæ; though the first Plant, Monkia, has but three Chives, and does not seem to belong to this natural order.

12th, FLORES UNI SEMINI INSIDENTES, AGGREGATÆ; this Class comprehends all the Aggregatæ and Compositæ. It is divided into six great Orders. The

1st, PLACENTA COMMUNI NULLA; here he places only Valerian: which perhaps would have come better with Circæa and the Stellatæ.

2d, ARE the STAMINA LIBERA, or our AGGREGATÆ.

3d, THE CAPITATÆ.

4th, THE CORYMBIFERÆ.

5th, THE RADIATÆ; and,

6th, THE PLANIPETALÆ.

AFTER

AFTER this short sketch, need I affirm that HALLER follows Nature closer than ever any did before? How many natural Classes! How finely connected! if we except some few Plants of the Diplostemonæ; the first orders of the Isoptemonæ; the third great order of that Class, which is mixed, though with very natural subdivisions; the Meioptemonæ, and the first order of the Aggregatæ, with some very few Plants dispersed up and down. I dislike the mixing of trees, and it is for this reason alone I still prefer RAY, tho' in many other things much inferior to this learned Man; and remarkably so in the connecting his Classes. RAY neglected that too much, HALLER affects it every where, and has succeeded, except in two or three instances. Thus I do not think the Isoptemonæ and Diplostemonæ connected; for the putting in one Plant, as *Acer*, is not sufficient. I cannot say there is any affinity betwixt the Umbelliferae and the third order of that Class, nor betwixt the subdivisions of that order; nor do I think the Meioptemonæ at all proper; nor consequently have the Siliquosæ any relation to what go before them. Lastly, the Ringentes are not connected with the Aggregatæ.

THESE are the few defects; the rest appears to me unexceptionable.

HIS generical characters are excellent. To his specific ones (that are often his own, tho' sometimes taken from LINNÆUS) he constantly adds a description of the habit, virtues, &c. of the Plant. And lastly, let me affirm to his honour, that he is the first who, in his *Ordo Generum*, has put marks to distinguish those Genera inserted in his Classes that do not answer the classical character; nor has he omitted adding them to those Classes under which they ought, according to the rules of his system, to have been ranked.

WACHENDORFIUS published a system in 1747, of the UTRECHT Plants, taken much from ROYEN; but with such long GREEK names, and so astonishing a Synopsis, that few people have ever looked into it. He has many of ROYEN's natural Classes, but reverses his system in some measure: he calls the Cup and Petals a double Perianthium: he has some orders taken from the proportion or number of the Summits to the Filaments: he begins with the Umbelliferae, and follows LINNÆUS's names: when that author fails him, he takes up with BAUHIN's, not presuming to invent one. The very titles of his Classes are too tedious to copy; the reader must therefore have recourse to the work itself.

IN the MEMOIRES DE BERLIN for 1751, GLEDITSCH has given the outlines of another method. The great divisions are taken from the situation of the Chives: these are four

THALAMOSTEMONES, where they are fixed on one stage.

PETALOSTEMONES, ----- on the Petal.

CALYCOSTEMONES, ----- on the Cup.

STYLOSTEMONES, ----- on the Pointal.

EACH of these is divided into Chives united, or separate. This method seems entirely artificial; the superior orders are only given, and these generally are Apetalæ, Petalodæ, Æquales, Inequales. Till it is more finished, it is not capable of further examination.

THERE is another attempt to form a method in a very singular manner by GUETTARD: it is by a microscopical examination of the Hairs, Fibres, &c. of the Leaves. He began in 1747, and has not, I believe, finished his scheme. What he at present attempts is putting all those Plants together in an order that he finds agree in certain marks. I must observe, that he

he says he follows LINNÆUS's natural fragment, and that it is almost entirely the same with TOURNEFORT's. I have hardly met with a bolder affirmation.

FINALLY, SAUVAGES published, in 1751, a method, in which the characters of Classes are taken from the form, situation, and disposition of the Leaves.

He arranges all Plants under eleven Classes.

1. APHYLLÆ; those which have no Leaves, as Mushrooms. But he extends this farther than might be imagined; including even Rushes and Leeks, whose Leaves do not differ from their Stalks.

2. CESPITITÆ; Plants with Leaves in tufts, as Mandrake, Auricula, and the like; adding the Orchis's, and some of the Grasses.

3. SPARSÆ ANGUSTIFOLIÆ; Plants with narrow and scattered Leaves. This vast arrangement holds the Grasses, and many of the Liliacæ with leafy Stalks.

4. SPARSÆ LATIFOLIÆ; with broad scattered Leaves: this also comprehends a vast number; which are subdivided according to the shape of the Leaves. These arrangements, if they were correct enough for any certain use, would be rather FAMILIES, than Classes of Plants; and those subdivisions would be the proper Classes.

5. ADVERSIFOLIÆ; with Leaves in pairs; a very large number.

6. VERTICILLATÆ; with Leaves arranged in circles round the stalk. This disposition of Leaves is indeed singular, and in a manner classical.

7. DIGITATÆ; with fingered Leaves. This comprehends those Plants with several Leaflets rising from one point, from the Trefoils to Hemp.

8. PALMATÆ; with handed Leaves; divided into many segments, but not composed of distinct Leaflets; as Hop, the Figtree, &c.

9. PINNATÆ; with winged Leaves; containing the Pea and Vetch, and all such others.

10. DECOMPOSITÆ; with recompound Leaves; composed of numerous Leaflets set upon divided and subdivided ribs; as in the Carrot, Fennel, and the like.

11. LACINIATÆ; Plants with jagged Leaves; this also is another very large Class.

LITTLE need be added as to the value of this proposed arrangement. Science rejects it; for the foundation is erroneous. The differences of Leaves, far from being the proper marks of classical divisions, cannot give even the characters of Genera. Nature has established Laws we cannot break; and has affixed marks which we may trace, but cannot pervert. On whatever parts of Plants the distinctions of Class, Order, and Genus are established, the use of Leaves can be only in specific characters.

THE work is however ingenious, and the author deserves great praise for his precision and accuracy. A great deal is to be learned from him; though he fails in the purpose of a method.

HIMSELF is sensible of the great uncertainty of his characters; and has very justly and judiciously, for that reason, often repeated the same Plant in various Classes; because its Leaves grow sometimes in one of his arrangements, sometimes in another: he has instanced the yellow Willow-herb, which comes very naturally in his fifth Class; but, as the Leaves sometimes are more numerous at the joints, unnaturally blends itself also with his sixth.

Thus we have examined the different Systems hitherto invented; we have seen their good and bad: and all that is further necessary to be said on this subject may be comprehended in a few words.

RAY, ROYEN, and HALLER are the only authors that have, in spite of their method, attempted to follow Nature: all others have pitched upon some particular part of the Fructification, as the Fruit, the number, regularity or irregularity of the Petals; shape of the Flower; or shape and number of the Cup-leaves; or number of the Chives and Pointals. From one or other of these they have taken the characters of their Classes: that done, the whole vegetable race are distributed under some of those great divisions; though commonly numbers are put together that agree in no one thing, but the arbitrary character of the Class.

Is it therefore any wonder that these methods are as repugnant to Nature as to one another? Can we be surprized at the cruel wars every new system produced amongst Botanists? Each Systematick looked upon his own method as the rule of Nature; and consequently attacked all distributions that did not coincide with his. But in truth every author went on separate principles; the majority agreeing only in neglecting Nature. One had therefore no right to censure the other, provided he kept strictly to his own rule. And let me here observe, that the very worst, the most unnatural of these productions, have been of great use to the study of Botany. The father of it had some favourite part of a Vegetable he preferred to the rest; he examines this in every light, and gives us a thousand good observations relating to it: others do the same. It is therefore to the united endeavours of these contending heroes we owe our knowledge of the various organs of Plants; their writings have served for scaffolds to RAY, HALLER, and ROYEN.

WHOEVER excels these must still begin to mount by the assistance of those that went before him. The superior genius of LINNÆUS has, in his Philosoph. Bot. in his characters, &c. despised these helps, and explored untrodden paths: what was before him vague and uncertain, he has reduced to order and permanency; and even formed an alphabet, a new language, for this delightful science; freed it from a thousand defects, and embellished it more in a few years, than all the labours of antiquity had done in many ages. But still a great deal remains; for LINNÆUS is arbitrary, and Nature is yet neglected.

SYSTEMS of Plants seem to be necessary for two distinct purposes; the one to assist the memory; the other to range vegetables, in such a manner, that every Tribe, Division, and Family may seem to be allied to those that precede, as well as follow it. In this last distribution, no arbitrary character of Tribes, &c. is upon any account to separate Plants naturally connected: this System is therefore more adapted to a natural history, than to facilitate the discovery of an unknown Plant.

WE have seen, in running over the various methods, that they have been reputed good or bad, according as they approach Nature; hence the disputes between writers on Botany. Whereas, in truth, though some approach nearer the mark than others, no system extant hitherto at all deserves the appellation of natural.

ALL have had in view the two very different purposes mentioned above, which appear incompatible with one another; they must therefore be separated, and Nature severely followed in the latter, though attended with a thousand difficulties to the learner: not but that ways will be found to obviate many of them.

PREVIOUS to the natural system, an artificial one must be formed, merely to assist the memory, and make us certain of the Plant we examine: for reason tells us, we must know a thing by sight, before we can pretend to assign it a proper place.

AND certainly, such a system may be formed for this purpose, as with very little time or trouble, will enable a person unacquainted with Botany, to find out an unknown Plant as certainly as he would a word in a dictionary.

THIS will suit alike all the purposes of beginners; for, beside the regular students, there are many people of distinction possessed of great variety of Plants, that have neither time nor inclination for botanical researches, and yet wish to name a tree or Herb that draws their attention. For these, and for the fair sex, this index is calculated. It has therefore no title to the name of System; let it be called a botanical index or dictionary. Here we fix upon arbitrary characters for Classes, Tribes, and Divisions; under these every Genus must be marshalled, and, in order to keep the Genera sacred and entire, wherever there are found Species in a Genus, differing from the characters its companions range under, the Genus will be repeated in some other Class, to whose laws the dissenting Species will submit, and that, sometimes, wherever such difference appears. What is said with regard to Classes, holds also in the inferior orders; so that in this index we shall find a Genus, not only repeated in different Classes, but several times in the same Class under different orders. This will be so far from breeding confusion, that it will produce an absolute certainty of the Plant sought for: and to make it still more easy, the Flower of each Plant, expressive of the particular character it is ranged under; its habit, and its other distinctive parts, will be engraved: This will be sufficient to answer all the views intended by this index. Here then all Genus's will be kept entire, though in their arrangement, Nature will be totally neglected: and with regard to the species, the part from whence the specific character is drawn, whether it be Leaf, Flower, Habit, &c. will be also engraved.

THUS we have a universal dictionary to the vegetable kingdom, equally useful to the young beginner, and the real Botanist; for where is the man blest with a sufficient memory to retain the marks of so many thousand Vegetables.

LET not some critick tell us, after this declaration, that we break all natural Classes, and separate near relations; we mean to do so. We mean, in the following Work, to have no mercy upon any Class, any Order, any System, that stops a minute our pursuit. With the utmost reverence for Nature, we chuse in this performance an easier guide; and if we attain the end proposed, this mere artificial index shall pave the way to a System of another kind; we are bold to say, a more natural one, than has hitherto appeared: and so indeed it must be, or we should scarcely think it worth our while to give it to our country.

IT might be expected perhaps, that the method of LINNÆUS should be assumed as this artificial System or Index of Plants; but we have shewn its imperfections for that service. We shall be infinitely obliged to him for the materials with which a new and more determinate artificial System may be formed; but more consideration, and farther researches into Nature, the only sure guides, shew us that a new System or Index of this kind may be established; the characters of which will be at least more familiar than his, if not also more determinate.

BEFORE we draw the outlines of this index, let us state the difficulties that generally attend the first steps of Botany. These proceed from the different views each Botanist has had in forming his System.

BOTANY, like other branches of Natural History, has been reserved for a few studious men; too unfashionable to form a part of genteel education: it is generally acquired from books, and seldom or ever taught in universities. RAY is the favourite of this country; his Synopsis is commonly the initiating work: of late indeed, the Linnean System has been introduced, and even our Ladies now number Chives and Pointals; but what immense difficulties attend the learner, who first attempts this or any other botanical performance. The want of generical specifick characters in RAY, renders that author (though excellent in his way) unintelligible to a beginner: nor is LINNÆUS much easier. His characters are excellent, but necessarily long; essential differences, seldom existing in a single part, must be made out by strict examination of the whole, and an exact comparison with neighbouring Genera. And is this so easy a work? besides, how many are the exceptions to his rules? They abound in every Class. Some indeed are remedied by rules of proportion, that an adept may profit by; but it will certainly puzzle a learner to obviate these and the other difficulties. They arise

1. FROM the characters of the Classes frequently taken from inconspicuous or various parts of Plants; and these parts ranged in different Classes. Thus RAY draws his classifical character, sometimes from the Flower, sometimes from the Fruit, the Root, the Leaves, &c. LINNÆUS, more artificial, and therefore more uniform, takes the Chives, either as to number or proportional length: to these are added Classes of male, female, &c. Plants. The first followed Nature, the last maintained his sexual System.

2. FROM several Genus's in all Systems, answering in no particular to the character of the Class they are ranged under; and this the oftener, the nearer we follow Nature.

3. FROM the frequent varieties happening in the same Genus.

4. FROM the not being able to distinguish in a long character, the essential marks that separate the Genus's from one another.

5. THE necessity of often waiting for the Fruit before the real Genus can be determined with certainty.

THESE difficulties and many more most young beginners have no doubt experienced: but it will not be difficult to remove entirely these and other impediments. Thus in our work,

1. THE Flower, as the most obvious part of the Plant, will furnish invariably the classifical character.

2. No Genus will ever be placed in any Class, the character of which it does not strictly answer.

WHEREVER any Species of a Genus varies from the Class or order it is placed in, that Genus will be repeated, under other Classes or Orders, which each varying Species shall suit.

4. No part of the generical character will be expressed, but what is absolutely necessary to distinguish a Genus from others in the same Class.

FINALLY, the generical character will be drawn from parts visible to the eye during the Efflorescence; such as the Cup, Petals, Chives, Pointal, and Germ.

THE following page will show the key of the Classes.

A TABLE

THE VEGETABLE SYSTEM.

45

A TABLE of the DISTINCTIONS and CHARACTERS of CLASSES in the ARTIFICIAL METHOD; or INDEX of PLANTS.

PLANTS may be divided into

HERBS, bearing Flowers

Visible;

Assembled together in a

Common Cup;

SERIES 1:

With united Chives:

The Corollæ, Tubulated with Rays, —

Tubulated without Rays, —

Tongued, — —

CLASSES.

1. Radiates.

2. Florets.

3. Semiflorets.

EXAMPLES.

Sunflower.

Tanzy.

Sowthistle.

SERIES 2.

With distinct Chives, — —

With distinct Cups, forming a head or ball, —

4. Associates.

5. Aggregates.

Thistle.

Thrift.

Separate, on Pedicles

SERIES 3.

Issuing from one point, — —

Springing from various Points.

Perfect, viz. Chives and Pointal in the same Flower, or separate on the same Plant:

Complete, viz. furnished with both Cup and Petal.

SERIES 4.

Regular.

With One Petal, — —

Two Petals, — —

Three Petals, — —

Four Petals, — —

Five Petals, — —

Six Petals, — —

Many Petals, — —

7. One-petal'd.

8. Two-petal'd.

9. Three-petal'd.

10. Four-petal'd.

11. Five-petal'd.

12. Six-petal'd.

13. Many-petal'd.

Primrose.

Enchanter's Nightshade.

Spiderwort.

Tree Primrose.

Pink.

Hepatica.

Houfleck.

SERIES 5.

Irregular.

With One Petal, — —

Two Petals, — —

Three Petals, — —

Four Petals, — —

Five Petals, — —

Six Petals, — —

Many Petals, — —

14. One-petal'd.

15. Two-petal'd.

16. Three-petal'd.

17. Four-petal'd.

18. Five-petal'd.

19. Six-petal'd.

20. Many-petal'd.

Snapdragon.

Lady'slipper.

Milkwort.

Lupine.

Pansie.

Iris.

Monotropa.

Incomplete, viz. only Cup or Petal, or neither.

SERIES 6.

With Petals without Cup.

One Petal, — —

Two Petals, — —

Three Petals, — —

Four Petals, — —

Five Petals, — —

Six Petals, — —

Many Petals, — —

21. One-petal'd.

22. Two-petal'd.

23. Three-petal'd.

24. Four-petal'd.

25. Five-petal'd.

26. Six-petal'd.

27. Many-petal'd.

Corn-Flag.

Corispermum.

Xyris.

Virgins Bower.

Marsh Marygold.

Bulbocodium.

Globeflower.

SERIES 7.

With Cups without Petals.

Of One Leaf, — —

Two Leaves, — —

Three Leaves, — —

Four Leaves, — —

Five Leaves, — —

Six Leaves, — —

Eight Leaves, — —

28. One-leav'd.

29. Two-leav'd.

30. Three-leav'd.

31. Four-leav'd.

32. Five-leav'd.

33. Six-leav'd.

35. Eight-leav'd.

Pellitory of the Wall.

Pepper.

Bur-reed.

Petiveria.

Orach.

Scheukzeria.

Lady's Mantle.

SERIES 8.

Neither Cup nor Petal,

but a Husk, — —

36. Chaffy.

Grasses.

SERIES 9.

Only Chives and Pointal, — —

37. Thready.

Zanichellia.

SERIES 10.

Imperfect, viz. Chives on one Plant, Pointal on the other.

Chives alone, — —

Pointals alone, — —

38. Chive-flowers.

39. Pointal-flowers.

Melons.

Melons.

Invisible to the naked Eye.

Terrestrial.

SERIES 11.

With Leaves, — — — —

40. Ferns.

SERIES 12.

With articulated Scales, — — — —

41. Mosses.

SERIES 13.

With no sort of Leaf, or Scale, — — — —

42. Mushrooms.

SERIES 14.

Sea-Plants, — — — —

43. Marines.

TREES, SHRUBS, and UNDERSHRUBS.

VOL. II.

N

C H A P.

C H A P. II.

Of the DISTRIBUTION, NUMBER, and SUBDIVISIONS of the CLASSES.

THE preceding are plain, certain and obvious distinctions; founded on characters and marks, which are always to be seen in the Plant, when in Flower; and which perfectly serve the purpose of classical divisions; without waiting for the Fruit or Seed.

ACCORDING to these all Plants are arranged under forty-three Classes; of each of which the preceding Plate gives an instance in a single object.

BUT between this large assortment of Classes, and the peculiar arrangement of Plants into Genera, there may be established a subordinate and very useful distinction. In the same Class there will be many Genera naturally united by some one striking character; and these may be arranged under the name of an ORDER, or Subdivision of the Class. In many of the Classes there will be several such general agreements of Plants from certain conspicuous characters, which will give a new and useful division into a first, second, third Order, and so on. These subordinate marks, though they be not sufficient to become classical characters, yet will perfectly answer this purpose; and by dividing the number of Plants in the Class, will make any one that is sought, the easier to be found. This will be explained familiarly by the arrangement of the several Orders of the first Class.

C H A P. III.

Of the FIRST CLASS.

Plants with visible Flowers, many assembled together in a common Cup; with united Chives, and tubulated Florets surrounded by Rays.

BEFORE we enter on the subdivision of this Class, it will be necessary to explain the terms which constitute its character.

WE have shewn in the preceding Plates, that by the term Chives are meant those upright, slender bodies crowned with dusty heads, which occupy, in a certain number, the inside of a Flower; and surround the Rudiment of the Fruit, or the Style which rises from it.

THESE Chives consist of two different parts; the slender body supporting the head, and the head itself. The first we call the THREAD of the Chive, the other its SUMMIT; the term Chive including both, and expressing the whole.

THE term Floret is used distinctively to express a single pip of this head or assemblage; the whole cluster, together with the general Cup, being named in express terms the Flower.

THE Rays are the flat Petals surrounding the Verge.

FLORET is a diminutive of Flower; and is a necessary distinction in the Plants of this assembled kind which have two sorts, as the tubulated and radiated in the same Cup; and even in the second and third Classes, where all are of one kind, it is useful; because it gives us a distinct manner of expression.

THUS, in speaking of the common Plant, Groundsell, we shall be regularly understood when we call the entire assemblage of pips in one common Cup, the Flower; and any one of those pips separated a Floret.

THE term Tubulate or hollow is used only in distinction from the character of the Rays, and of the Florets of the third Class, which have all the other characters of the rest,
but

but that the Florets are flat, or, as the selected term expresses it, tongued. In the present Class there is an assemblage of the two kinds; tubulated Florets occupying the Centre, and Rays, which are of the nature of tongued Florets, forming the verge.

THE form of the tubulated Floret is very regular and constant; and therefore easily known.

IT is made of a single Petal; and is a long, slender Tube, which grows large upwards; and spreading out at the verge like a bell, is there divided into five Segments. These naturally spread open, and often turn back. This form and division are both invariable. Such a Floret is represented in Plate 14, Figure 1. The Chives and Style being taken out not to disturb the view.

THIS Floret naturally rises from the summit of the embryo Seed, where there is a little rising verge that defends its base, in manner of a Cup, beside the general or common Cup, which includes all the Florets, with their subjacent Seeds: this is fixed to the swollen head of the Footstalk, which is what we call the Common Receptacle.

THE Chives in each Floret answer to the number of the divisions of its Rim: they are naturally five; and they take their origin from the neck of the Pip. A tubulated Floret with its Chives as they stand naturally, is represented at Plate 14. Fig. 2: and at Plate 14. Fig. 3. is a Floret of the same form cut open to shew their insertion: the long, slender body split at the end, which rises in the midst of these Chives, and pierces the Tube they form, is the female Organ or Style of the Floret; and being alike in all the Flowers of this and the two succeeding Classes, it has nothing to do in the classical characters, nor can be the least serviceable even in our subdivisions. It is figured because it exists in nature, but is to be passed over unregarded.

THE union of the Chives is thus formed.

THEIR Threads are very slender and very short; their Summits are oblong, of equal breadth, and raised erect: they touch, and are joined one to the other at the sides, and together form a hollow Cylinder with an indented Rim; or a regular firm Tube, like what our joiners make when they compose a hollow shaft of a column of a number of plain narrow boards.

THE verge of this Tube usually reaches nearly or entirely to the height of the Floret itself; and therefore appears in it as if it were another, and yet lesser, Flower.

THE Chives with their united summits separated from the Floret are represented at Plate 14. Fig. 4; at Fig. 5. the same with the Style, and at Fig. 6. with one Chive separated from the rest.

WHATEVER Plant has its general Flower composed of Florets of this tubular form, surrounded by a verge of Rays, and the Chives thus united, is of the first Class. There are very many such, and it will be therefore useful to arrange them in different orders; according to the most certain and obvious distinctions which are common to any number of them.

As the character of the Class is established upon the form and construction of the Florets and Rays, these distinctions of the orders of the Class are to be sought in the entire Flower. There is an essential part of it remaining from which we may take them; this is the general or common Cup, which includes the whole assemblage of Florets and Rays.

THAT we may be distinctly understood in this, a common Cup is represented at Plate 14. Fig. 7. The same Cup is also represented at Fig. 8. cut open to shew the manner wherein the receptacle of Flowers is contained in it: and the receptacle separated at Fig. 9.

THE common or general Cup in the Plants of this Class is either entire, or composed of several Leaves, Scales or Segments; and these, according to their number or various arrangement, in a single series or in several ranges, or with a peculiar circle at the Base, will give the characters

characters of five natural orders in this Class: for in all these instances, where one Plant of a kind has the Cup of a peculiar shape or structure, all of the same Genus have it with the same character.

THUS we have a regular subdivision of the great Class of tubulated Florets with Rays, and with united Chives, into no less than five regular subdivisions, each marked and ascertained by a distinctive character. These constitute the five orders. The Down upon the Seeds of these Plants might furnish also some other characters of distinction, but the former are sufficient; and we comprise all characters within the compass of the Flower.

THE five Orders of the first Class are these.

O R D E R I.

PLANTS with assembled tubulated and radiated Florets and united Chives, whose general Cup is ENTIRE; that is, of one Piece, only cut into slight Segments at the rim. See Pl. 14. Fig. 10.

O R D E R II.

PLANTS with assembled tubulated and radiated Florets and united Chives, whose general Cup is SIMPLE; that is, formed of a single series or row of Leaves, Scales, or Segments. See Pl. 14. Fig. 11.

O R D E R III.

WHOSE general Cup is DOUBLE; or composed of two distinct rows of Scales. Pl. 14. Fig. 12.

O R D E R IV.

WHOSE general Cup is TILED; or composed of numerous Scales in rows lying over one another, the outer ones gradually shorter than the inner. See Pl. 14. Fig. 13.

O R D E R V.

WHOSE Cup is FRINGED; or has, beside a single series of oblong Scales which enclose the Florets, a distinct single series of shorter Segments, which serve as it were as a Cup to the other, and appear a kind of fringe round its bottom. See Pl. 14. Fig. 14.

THESE Characters are distinct, and independent of the general shape of the Cup.

IN the preceding instances, at Figures 10, 11, 12, 13, 14, we have given the Cup alone, divested of the Florets; because the peculiar formation of the Cup which gives the character of the Order may be thus best understood: but that they may be also known as they appear in Nature on the Plant, we have represented them in the five succeeding Figures, 15, 16, 17, 18, 19. with the Florets in them.

THE intire Flower of the Tagetes with its Cup, is represented in this view at Fig. 15, to shew what is meant by an entire Cup.

THE Flower of the Coltsfoot at Fig. 16, to shew the SIMPLE Cup, or that consisting of a single row of Scales.

THE Flower of the Marygold at Fig. 17, to shew the DOUBLE Cup.

THE Flower of the China Aster is represented entire at Fig. 18, to shew the structure of a TILED CUP that is composed of several ranges of Scales laid like tiles over one another.

THE Flower of the Senecio is represented at Fig. 19, to shew the structure of the FRINGED Cup; or that which is formed of a series of long Scales, with a number of short ones at the bottom.

THESE five Figures therefore represent the five distinct Orders of the first Class; all agreeing in the form of the tubulated Floret divided into five Segments; and in the surrounding Rays.

H E R B S.

S E R I E S I.
With UNITED CHIVES.

C L A S S I.

With ASSEMBLED TUBULATED FLORETS, furrounded by Rays.

O R D E R I.

With the GENERAL CUP ENTIRE.

G E N U S I.

F R E N C H M A R Y G O L D *.

T A G E T E S.

Character of the Genus.

The Cup has five Ridges lengthwise, and five slight Indentings at the Rim.

Plate 15. Fig. *o a a b*.

1. SPREADING FRENCH MARYGOLD.

Plate 15. Fig. 1. COMMON FRENCH MARYGOLD.

Character of the Species.

The Stalk is divided, and subdivided, into a multitude of spreading Branches.

Tagetes patula.

Fig. 1. *a a b b*.

COMMON as this Plant is now in our gardens, it is a native of Mexico: we raise it in hot-beds in Spring, and it bears the free air afterwards. It is an Annual, a yard high, with dusky Leaves, and deep purplish yellow Flowers, appearing in succession from July to October. The Flowers have naturally an ill smell, but culture takes this off; and yields them also striped, double, curled and quilled with vast variety and beauty. We call it the French Marygold.

2. UPRIGHT FRENCH MARYGOLD.

Plate 15. Fig. 2. AFRICAN MARYGOLD†.

Character of the Species.

The Stalk is undivided, and supports a few Flowers, placed singly on naked Footstalks.

Tagetes erecta.

Fig. 2. *a b b*.

THIS also is an Annual, native of Mexico, but hardy enough to bear the open air with us through Summer. It is four feet high; the Leaves are pale green, and the Flowers of a faint, and but inelegant yellow. It blows from July to the very end of Summer. Culture has all the happy effect on this we have mentioned in the other: the Flower grows double, and the added Petals fold, curl, and wave, and quill about, and among one another, with a great encrease in size and beauty.

3. PETTY TAGETES.

Plate 15. Fig. 3.

Character of the Species.

The Stalk is undivided, and the Flowers are clustered upon scaly Footstalks.

Tagetes minuta.

Fig. 3. *a a b*.

THIS pale and dwarf resemblance of the upright kind we have from Chili. It is an Annual; flowering late in Autumn; with edged Footstalks to the Leaves, and filmy supports to the clustered Flowers. They are little and white.

* The received English names, both of the Genera and Species of Plants, it must be owned, are often injudicious. This before us is an instance: for the Plants are not of the Marygold kind; nor are they the produce of either France or Africa. It would be easy to contrive better denominations: but, as these are universally known, it appears more eligible to retain them. To prevent any ill effect from this, the regular generical Latin name, will be always added at the head of the Genus; and the received trivial Latin name to every Species. The trivial English name where there is any such, will be also added in a peculiar character over the Latin.

† THIS is an instance of a very improper trivial English specific name; since it would seem rather the denomination of a different Genus, than only of a distinct Species. It will be better hereafter to call the Plant by the name here given, UPRIGHT FRENCH MARYGOLD: the term African is only annexed, because it is in use.

G E N U S II.

S E G G R O M.

O T H O N N A.

Character of the Genus.

The Cup is even on the Surface; and is cut into eight Segments at the edge.

Plate 16. Fig. 1. *a a*.

1. KIDNEY-LEAV'D SEGGROM.

Plate 16. Fig. 1.

Character of the Species.

Othonna geifolia.The Leaves are rounded, sunk in at the Footstalk, and indented about the edge.
Fig. 1. *a*.

THIS is a small, perennial, creeping Plant; native of the hotter parts of Africa. The bottom of the Stem is hard, tho' but weak; leaning, and trailing on the ground, but this way crawling to the length of two feet or more. The Leaves are of a brownish green, and the whole Plant has so much of the aspect of Ground-Ivy, both in their form, and in its manner of growth, that one is surpris'd to see upon it radiated Flowers. They are of a delicate yellow; and blow all Summer.

2. EGG-LEAV'D SEGGROM.

Plate 16. Fig. 2.

Character of the Species.

Othonna bulbosa.The Leaves are of the shape of an egg; the Stalk is tender to the bottom.
Fig. 2. *a b*.

THIS also is a Perennial, though a weak, low Plant: we have it from the same warm climate with the other; for Nature spreads it over the Æthiopian sands in great profusion. The Leaves are bright green, and the Flowers gold yellow. The weak Stalk rises but to eight or ten inches, and that leaning toward the Base. The Root is singular: it is rounded as our Crowfoot, or as the Turnep kind; a globular tuberos one; but not at all a Bulb.

3. AMPLEXICAUL SEGGROM.

Plate 16. Fig. 3.

Character of the Species.

Othonna sonchifolia.The Leaves are long and jagged, and they embrace the Stalk at their Base.
Fig. 3. *a a*.

THIS is a specious, though singular Plant. We have it from the remote Africa, with its brethren: but it rises higher, more erect and stately; and has vast crimson Flowers. The colour of the Leaves is a dull green. LINNÆUS calls this Sonchus-leav'd Othonna; but even trivial names should give some character. Himself has taught us to avoid the practice.

4. HEART-LEAV'D SEGGROM.

Plate 16. Fig. 4.

Character of the Species.

Othonna fibrica.The Leaves are heart-shaped and dented; the Stalk is unbranched.
Fig. 4. *a b*.

THIS is a native of Siberia: a Perennial, with large, handsome, pale green Leaves; and a slight, simple, almost naked Stalk. The Flowers are of a Lemon yellow. It blows from June to September.

5. M A R S H

5. MARSH SEGGROM.

Plate 17. Fig. 1.

Character of the Species.

The Leaves are lanced, and sharply dented.

Othonna palustris.Fig. 1. *a a*.

THIS is a perennial English Plant, native of our marshes toward the sea; and flowers from June to October. It is a yard high, and scarce at all divided into Branches. The Stalk is thick and often red; the Leaves are of a fine fresh green; the Flowers are large, and of a golden yellow. The indentings of the Leaves are deepest toward the ground.

6. UMBRELLA'D SEGGROM.

Plate 17. Fig. 2.

MOUNTAIN RAGWORT.

Character of the Species.

The Leaves are undivided: the Flowers grow at the top like an umbrella.

Othonna integrifolia.Fig. 2. *a b*.

THIS also is an English Plant; a Perennial, native of our high grounds, and flowers in August. It is a foot high, upright, robust, and simple in the Stalk: the Leaves are broad and lanced; of a greyish green, and naturally undivided, except for here and there a slight dent. The Flowers are of a faint yellow. At the head of the Stalk, where the Footstalks of the Flowers rise, there is a kind of thready mantle. It has in this a strange alliance with the umbrella'd Plants.

7. WHITE-HAIRED SEGGROM.

Plate 17. Fig. 3.

Character of the Species.

The Leaves are lightly covered on each side with long, distant, white hairs.

Othonna helettis.Fig. 3. *d*.

THIS is a Perennial, native of France and of the remote Siberia. It is half a yard high, with an undivided Stalk. The Leaves are oblong, lanced, and are most delicately and minutely sawed along the edge. The Flowers are yellow, and blow in July. One crowns the Stalk, and a kind of Umbel rises round it. The Flowers succeed one another; the simple one at the head opening first.

8. PINNATIFID SEGGROM.

Plate 17. Fig. 4.

Character of the Species.

The Leaves are cut into deep Segments, and those are again divided.

Othonna cineraria.Fig. 4. *a a*.

THIS is a North-American; a Perennial; that flowers from June to August. The Stalk is tender, but half a yard in height, and branched. The Leaves are of a dusky green, and hairy on the under part. The Flowers are of a delicate yellow, and the Rays spread flat and wide open. There is something in the aspect of the Plant like the Sea Ragwort, but it is not shrubby.

O R D E R

9. MEALY SEGGROM.

Plate 17**. Fig. 9.

SEA RAGWORT.

Othonna maritima.

Character of the Species.

The Leaves are broad, cut in the pinnatifid manner, and the segments cut again.

Fig. 9. a b.

THIS is a Perennial, native of the coasts of France and Italy, and flowers in September. The Stem is woody, and a yard high: the Shoots are tender and greyish: the Leaves are white, and mealy on the under part, which they shew in various directions: the Flowers are small and yellow: the singular whiteness of its Leaves, and its bushy aspect, have long kept it in our gardens.

10. PECTINATE SEGGROM.

Plate 17**. Fig. 10.

Othonna pectinata.

Character of the Species.

The Leaves are oblong, and sinuated in even rows, like the teeth of a comb.

Fig. 11. a b.

THIS is a perennial woody Plant, native of Æthiopia, and flowers in August: the Stem is brown: the Leaves are of a delicate and fine green: the Flowers are yellow.

11. MULTIFID SEGGROM.

Plate 17**. Fig. 11.

Othonna Abrotanifolia.

Character of the Species.

The Leaves are cut into innumerable narrow segments in the winged manner.

Fig. 11. a b.

THIS is a perennial Plant, with a woody Stem, native of the Cape of Good Hope: it flowers in August. The old Bark is of a reddish hue: the young twigs are green: the Leaves are of a pale, and somewhat greyish green: the Flowers are yellow.

12. VARIOUS LEAV'D SEGGROM.

Plate 17**. Fig. 12.

Othonna coronopifolia.

Character of the Species.

The lower Leaves are lanced, and undivided: the upper are deeply cut.

Fig. 12. a b.

THIS also is a woody Plant, a Perennial, native of the Cape of Good Hope, and flowers in August: the Stem is brown: the young Shoots are often tinged with a very delicate crimson: the Leaves are of a fresh and elegant green: the Flowers are yellow.

13. GLAUCOUS SEGGROM.

Plate 17**. Fig. 13.

Othonna cheirifolia.

Character of the Species.

The Leaves are fleshy, lanced, obtuse, and undivided.

Fig. 13. a b.

THIS is a Perennial, native of Africa, and flowers in September. The Base of the Stem is woody, and it divides into a great number of Branches of a foot and half long, which lie upon the ground at their origin, but raise their leafy tops. The Bark of the woody part is of a pale brown: the Leaves are very thick set, and of a peculiar and pleasing colour, a pale bluish green; such as we see on many of the sea Plants. The Flowers are yellow.

14. WEDGE-LEAV'D SEGGROM.

Plate 17**. Fig. 14.

Othonna dentata.

Character of the Species.

The Leaves are of an oval form, but broad and wedgy at the end.

Fig. 14. a b.

THIS is a native of the Cape of Good Hope, a bushy Plant, with a hard Stem, flowering in August: the old Bark is greyish: the Branches are of a pale green: the Leaves are also of a pale but fresh green; and the Flowers are large, and of a very beautiful yellow.

** Firmness of the Stalks in these last Seggroms is not to place them among Trees and Shrubs: they are properly woody Plants: the Cape affords a number of like structure, and even Europe is not destitute of them; nor is this limited to the perennial Plants: we have Annuals whose Stems are absolutely woody. The Shores of France and Sicily shew it in the Buboniums, which will be described hereafter, page 40. and BOCCONE has not unjustly added it to the distinctive characters of one of them. His After Supinus Lignosus is an Annual; the Footstalk'd Bubonium of our succeeding; 74 Plate, Fig. 3. and we shall have occasion to shew more instances.

O R D E R

ORDER II.

With the Cup SIMPLE: or formed of a single Row of Scales:

GENUS I.

HEMP-AGRIMONY.

BIDENS.

Character of the Genus:

The Cup is broad ; and its Scales are equal, pointed, and hollowed lengthwise:

Plate 18. Fig. *o a a b*.

1. DROOPING HEMP AGRIMONY.

Plate 18. Fig. 1. UNDIVIDED LEAV'D HEMP AGRIMONY.

Character of the Species.

Bidens cernua.

The Leaves embrace the Stalk ; the Flowers hang drooping ; and the Seeds stand strait.

Fig. 1. *a b c*.

THIS is an Annual, three feet high, native of our ditch-sides, and flowers in Autumn. The Stalks are tinged with crimson ; the Leaves are of a deep green, and have something of the same redness. The Flowers are of a delicate yellow, and there are several oblong Leaves under the Cup. The seeds do not spread, but stand strait. The Rays often grow to the Scales of the Cup.

2. VERTICILLATE HEMP-AGRIMONY.

Plate 18. Fig. 2.

Character of the Species.

Bidens verticillata.

The Flowers grow in circles round the Stalks, and the Leaves are hoary underneath.

Fig. 1. *a a b*.

THIS is an Annual, native of Vera Cruz ; a low Plant, flowering most part of the year. The Stalk is reddish ; it trails upon the ground to a foot long. The Leaves are of a fresh green on the upper side, but underneath they are white and downy. The Flowers are small and yellow. The Leaves stand alternately on the lower part of the Stalk ; but in pairs on the upper part, where the Flowers grow.

3. TWICE-

3. TWICE-WINGED HEMP-AGRIMONY.

Plate 18. Fig. 3.

Character of the Species.

Bidens bipinnata.

The Leaves are winged, and the divisions winged again; the Seeds spread.

Fig. 3. *a a b.*

THIS is an Annual, native of Virginia, and flowers in August. The Stalks are yellowish, and the Leaves of a faint green. The Flowers are often but imperfectly radiated; and sometimes they want the Rays entirely; but when perfect they are very beautiful.

4. SIMPLY WINGED HEMP-AGRIMONY.

Plate 18. Fig. 4.

Character of the Species.

Bidens frondosa.

The Leaves are winged, and the Leaflets are serrated.

Fig. 4. *a b.*

THIS is an Annual, native of Virginia. It is four feet high, and flowers in July. The Stalk is red; the Leaves are dusky, and the Flowers are of a delicate yellow.

5. BUBBLY HEMP-AGRIMONY.

Plate 18. Fig. 5.

Character of the Species.

Bidens bullata.

The Leaves grow in pairs on the lower part of the Stalk, and in threes above.

Fig. 5. *a a.*

THIS is an Annual, native of America; an upright, hairy Plant, flowering in June. The Leaves are of a dead green, rough, and raised in bubbles. The Flowers are yellow.

* * * THERE are other *Bidens*'s, which have no Rays, and will be found in the second Class.

ORDER

GENUS II.

COLTSFOOT.

TUSSILAGO.

Character of the Genus.

The Cup is oblong; its Scales are narrow, flat, and equal: the Rays of the Flower are narrow.

Plate 19. Fig. *a a b*.

1. COY COLTSFOOT.

Plate 19. Fig. 1.

Character of the Species.

Tussilago anandria.

The Leaves are egg-shaped, but have also some small divisions towards the Base.

Fig. 1. *a b*.

THIS is a Perennial, native of Siberia, a low and humble Plant, so coy and delicate in the opening of its Flower, that it requires warm courtship from the Sun; and in the northern climates was supposed for a long time incapable of blowing at all. The Leaves are of a delicate green, and their under side is downy. The Stalk is weak, tender, reddish, and but four inches high: naked, except for a few slight films; and at its top supports only a single Flower. This is large, and of a delicate snowy white.

2. HEART-LEAV'D COLTSFOOT.

Plate 19. Fig. 2.

COMMON COLTSFOOT.

Character of the Species.

Tussilago farfara.

The Leaves are heart-shaped, but cornered and indented; the Flower-stalk is thick and scaly.

Fig. 2. *a b*.

THIS is our common Coltsfoot, a perennial Plant, frequent in wet, tough soils; whose Flowers appear in February, and its Leaves not till April. The Stalk supports only a single Flower; it is thick, tender, hollow, redish, and covered thick with filmy scales. The Flower itself is large, specious, and yellow. The Leaves are of a faint green, but on their under part white; covered with a tough, firm, cottony substance, capable of being wrought into cloth. An infusion of the Leaves of this Plant sweetened with honey is excellent in all disorders of the breast.

3. TOWERED COLTSFOOT.

Plate 19. Fig. 3.

Character of the Species.

Tussilago frigida.

The Flowers grow several upon one Stalk in a loose cluster.

Fig. 3. *a a*.

THIS is a native of the Swiss low grounds, and of their hollows between the mountains: it is a Perennial, flowering early in Spring. The Leaves are very large, of a black green on the upper side, and white underneath. The Stalk is thick and filmy, and the Flowers are small and of a pale crimson.

4. CRIMSON COLTSFOOT.

Plate 19. Fig. 4.

Character of the Species.

Tussilago Alpina.

The Leaves are small, and roundish, but hearted at the Base, and dented.

Fig. 4. *a b*.

THIS also is a Perennial; a small, low Plant, native of Germany, and flowers early in Spring. The Leaves are of a dark green, but hoary underneath; and the weak Stalk supports a single Flower.

*** LINNÆUS joins the Coltsfoot and Butterburr in one Genus. They are distinct; but the third Species connects the two Genera in the order of nature.

GENUS III.

WELT-WORT.

HELENIA.

Character of the Genus.

The Cup spreads broad ; its Scales are short, large at the Base, and narrow upwards.

Plate 20. Fig. *a b*.

Of this singular Genus we know only one Species.

GOLDEN WELT-WORT.

Plate 20. Fig. 1.

Character of the Species.

Helenium autumnale.

The Leaves run down the Stalk in lengthened films.

Fig. 1. *a a*.

THIS is a Perennial, native of North-America, a specious, tall, and gaudy Plant : it bears the air with us, and flowers in August. The Stalk is round and hollow, ribbed and winged from the Base of the Leaves, and grows to five feet high. The Leaves are of a delicate green, long, smooth, and narrow. The Flowers are very large ; they crown the spreading head of the Plant in a vast number, and are of a gold yellow.

GENUS IV.

HARD-SEED.

OSTEOSPERMUM.

Character of the Genus.

The Cup is hemispheric ; and its Scales are small and sharp pointed.

Plate 20. Fig. *a b*.

1. PALMATED HARD-SEED.

Plate 20. Fig. 2.

Character of the Species.

Osteospermum uvedalia dictum.

The Leaves are broad, and divided in the manner of a hand.

THIS is a perennial, robust, and specious Plant, native of Virginia, and flowers all the Autumn. The Stalk is five feet high. The Leaves are large : they stand in pairs ; and are divided into a number of deep Segments. The Flowers crown all the branches, and are large and of a delicate yellow. The Rays are few, but they are very long ; and the structure of the Disk is in no Plant more distinct or conspicuous.

*** THERE are other Osteospermums : but they are Shrubs, and have their place hereafter.

GENUS

G E N U S V.

SWAMP-FLOWER.

CHRYSOGONUM.

Character of the Genus.

The Cup spreads flat, and its Segments are only five; they are lanced and cut down to the Base. The Flower has only five Rays.

Plate 21. Fig. 1. *a b.*

1. FOOTSTALKED SWAMP-FLOWER.

Plate 21. Fig. 1.

Character of the Species.

Chrysogonum Virginianum.

The Leaves are placed upon long Footstalks.

Fig. 1. *a a.*

THIS is a Perennial, native of Virginia; a tender, though rough looking Plant; and flowers from June to September. The Stalk is ribbed, rough and hairy; and is divided toward the top into many Branches. The Flowers are yellow, and their Rays are only five.

2. AMPLEXICAUL SWAMP-FLOWER.

Plate 21. Fig. 2.

Character of the Species.

Chrysogonum Peruvianum.

The Leaves stand, without Footstalks, embracing the Stem.

Fig. 2. *a a.*

THIS is an Annual, native of Peru; and covered over with Flowers the latter part of Summer. The Stalk is upright, round, smooth, and divided. The Flowers are yellow; they stand singly on the heads of the Stalk and principal Branches. This is the Zinnia of late Writers.

G E N U S VI.

MAID-WEED.

PARTHENIUM.

Character of the Genus.

The Cup spreads out; the Segments are only five; they are roundish and cut to the Base.

Plate 21. Fig. 3. *a a.*

1. COMPOUND-LEAV'D MAIDWEED.

Plate 21. Fig. 3.

Character of the Species.

Parthenium hysterophoros dictum.

The Leaves are compound, and divided into many parts.

Fig. 3. *a.*

THIS is an Annual, native of Jamaica, flowering on the sandy, rising grounds in July. The Stalk is rounded, ribbed, weak, and slightly branched. The Leaves are of a faint and unpleasing green. The Flowers are yellow in the disk, but their few slight Rays are white.

2. EGG-LEAV'D MAIDWEED.

Plate 21. Fig. 4.

Character of the Species.

Parthenium integrifolium.

The Leaves are simple, of an egg shape, and dented at the edge.

Fig. 4. *a a.*

THIS is a Biennial, native of Virginia, and flowers in August. The Stalk is firm, and toward the top divided into many Branches. The Leaves are of a strong green; the Flowers are snow white, but their disk is yellow.

G E N U S

G E N U S VII.

BASE-SUNFLOWER.

MELAMPODIUM.

Character of the Genus.

The Cup spreads wide; its Segments are only five; they are oval, but extended greatly in length.

Plate 22. Fig. *o o a a*.

LARGE-CUPPED BASE-SUNFLOWER.

Plate 22. Fig. 1.

Character of the Species.

Melampodium Americanum.

The Segments of the Cup are equal in length to the Rays of the Flower.

Fig. 1. *a b*.

THIS is a Perennial, native of Vera Cruix, and flowers in August. The Stalk is lightly ribbed. The Leaves are of a fresh and very delicate green. The Flowers are yellow. The Rays of a paler, but the disk of a stronger colour. We yet know no other Species of this Genus.

G E N U S VIII.

BROAD-WEED.

TETRAGONOTHECA.

Character of the Genus.

The Cup spreads open; it has only four Segments, and these are flat and triangular, but hearted.

Plate 22. *o o a*.

OVAL-LEAV'D BROAD-WEED.

Plate 22. Fig. 2.

Character of the Species.

Tetragonotheca helianthoides.

The Leaves are oval, and waved at the edge.

Fig. 2. *a a*.

THIS is a Biennial; native of Virginia, and flowers in August. A robust, tall, and hardy Plant. The Stalk is raised up in round ribs. The Leaves are of a strong but coarse green. The Flowers are vast, and of a delicate yellow; their Rays are about twelve.

G E N U S

G E N U S IX.

B I R D - W E E D .

S I G E S B E C K I A .

Character of the Genus.

The Cup is very large, and has five long Segments divided to the Base : each Floret has also at its Bottom an oval, hollow Leaf.

Plate 23. *o a a a b c.*

1. SIMPLE - LEAV'D BIRDWEED.

Plate 23. Fig. 1.

Character of the Species.

Sigesbeckia orientalis.

The Leaves have Footstalks, which rise naked from the Stem.

Fig. 1. *a a.*

THIS is an Annual, native of China and other parts of the East ; and flowers in July. The Stalk divides toward the top into a few slight Branches. The Leaves are of a fine green. The Flowers are yellow ; and the Cup is covered with thick hairs. Birds make nests of those Cups.

2. ALATED BIRD - W E E D .

Plate 23. Fig. 2.

Character of the Species.

Sigesbeckia occidentalis.

The Leaves have Footstalks which run down the Stem.

Fig. 2. *a a.*

THIS is a Biennial, native of Virginia ; and flowers in June and July. It is a handsome Plant. The Leaves are of a fresh green, and the green rib they carry from their Base down the Stalk gives it variety and beauty. The Flowers are yellow.

G E N U S X.

F O R K W O R T .

M I L L E R I A .

Character of the Genus.

The Cup is triangular and flat, and has only three Segments, of which one is large and two are small.

Plate 23. Fig. *o a a a b.*

1. FIVE - FLOWERED FORKWORT.

Plate 23. Fig. 3.

Character of the Species.

Milleria quinquiflora.

The Leaves are heart-shaped ; and the Footstalks of the Flowers split.

Fig. 3. *a a.*

THIS is an Annual, native of Panama and Vera Cruz ; and flowers in August. The Stalk is ribbed and branched. The Leaves are of a dusky green, and spotted with black. The Flowers are of a delicate yellow.

2. TWO - FLOWERED FORKWORT.

Plate 23. Fig. 4.

Character of the Species.

Milleria biflora.

The Leaves are oval, and the Footstalks of the Flowers are single.

Fig. 4. *a a.*

THIS is an Annual, native of Campeachy. The Stalk is weak and reddish. The Leaves are of a fresh green. The Flowers are yellow ; but their Cups are often stained with crimson.

O R D E R III.

With the Cup DOUBLE, or formed of two rows of Scales; an outer and an inner Series.

G E N U S I.

LEOPARDS-BANE.

DORONICUM.

Character of the Genus.

The Cup spreads, and is formed of long and narrow Scales.

Plate 24. Fig. 1. a.

1. SPREADING LEOPARDS-BANE.

Plate 24. Fig. 1.

Character of the Species.

Doronicum pardalianches.

The rays of the Flower are broad and short; the Leaves are heart-shaped and have edged Footstalks.

Fig. 1. a b.

THIS is a perennial, hardy Plant, native of Switzerland and Hungary; and flowers in June. It is a yard high. The Leaves are of a faint green, and they lose their winged Footstalks toward the top of the Plant. The Flowers are of a delicate pale yellow.

2. RAMPING LEOPARDS-BANE.

Plate 24. Fig. 2.

Character of the Species.

Doronicum plantaginifolium.

The rays of the Flower are long and narrow; and the Side-shoots are long and rise alternately.

Fig. 2. a b.

THIS also is a Perennial, a tall and robust Plant; it is a native of the warmer parts of Europe, and flowers with us in the open ground in May. The Stalk is a yard high. The Branches are few: they are long, ramping, and alternate. The Leaves are of a pale green; and the Flowers large and of a very beautiful yellow.

3. WOOLLY LEOPARDS BANE.

Plate 24. Fig. 3.

Character of the Species.

Doronicum incanum.

The Leaves are woolly underneath: the Stalk is leafy, and supports only a single Flower.

Fig. 3. a b.

THIS is a native of the Pyrenæan and Swiss mountains; a hardy, though an humble Plant. The Stalk is single, unbranched, and is naturally brown. The Leaves are of a delicate green on the upper side, but white and woolly underneath; and the one Flower which crowns the summit of the Stalk is of a bright and glowing gold colour.

4. DAISY LEOPARDS BANE.

Plate 24. Fig. 4.

Character of the Species.

Doronicum bellidifolium.

The Stalk is leafless, and supports only one Flower.

Fig. 4. a b.

BUT that the alternate disposition of Scales in the Cup ascertains the Genus, one could not think this small Plant a *Doronicum*. It is a Perennial, native of the Alps and Pyrenæan mountains; and flowers early in Summer. The Leaves are of a deep green on the upper side, and pale below. The Flower which crowns the simple naked Stalk is perfectly white, only the Disk is yellow.

G E N U S

G E N U S II.

D A I S Y.

B E L L I S.

Character of the Genus.

The Cup rises, and is formed of equal Scales of a lanced shape, and not very numerous.

Plate 65. *o a a*.

1. N A K E D D A I S Y.

Plate 25. Fig. 1.

COMMON LITTLE DAISY.

Character of the Species.

Bellis perennis.

The Flower-stalk is naked, or destitute of Leaves.

Fig. 1. *a*.

THIS is a Perennial, native of our pastures, and universal almost as the grass which covers them; the common little Daisy. The Leaves are glossy and of a deep green; the Flowerstalk is usually reddish; and the Flower is white, more or less pyed and dappled with a light crimson; and has a yellow disk.

As humble and simple as this Plant is in our fields; it rises to a great deal, not only of singularity, but beauty, under the garden culture. From the pyed red and white, its colour grows more glowing, the crimson stronger, and diffused more generally; and with this encrease of tinct, there grows also doubleness in various forms; and a new offspring. The Florets of the disk, which are tubular and cut into five Segments, extend themselves on one side in length; two of the Segments grow into one at their edges, and stretching forward, form, instead of the original tubular Floret, a perfect Ray, like one of those at the verge. Thus is the disk obliterated, and the Flower is full, or double, and composed only of Rays: in the next stage, these Rays filled with abundant nourishment, instead of being plain and flat, rise into bubbles on the surface, or round themselves into quills: and finally, from the base of the Cup there will rise new Stalks, each supporting a small Flower; miniatures of the original from which they rise.

2. L E A F Y D A I S Y.

Plate 25. Fig. 2.

Character of the Species.

Bellis annua.

The Flower-stalk has Leaves upon it.

Fig. 2. *a*.

THIS is an Annual, native of the south of France, of Sicily, and Spain. The Stalk is weak and hairy, usually tinged toward the base with red, and of a pale green upwards: The Leaves are also of a faint green, and covered with white hairs: those on the Stalk are paler than such as rise from the root. The Flowers are white, with a yellow disk.

****** WHAT is called the great Daisy is distinguished from this Genus by its Cup; and will be found in its place hereafter: page 78. The confusion of names, occasioned by the imperfect observations of earlier Botanists, must not make us bring together differing Plants.

THE VEGETABLE SYSTEM.

G E N U S III.

STONEWORT.

VERBESINA.

Character of the Genus.

The Cup stands hollowed, and has two ranges of numerous channelled and ascendant equal Scales.

Plate 26. Fig. *a b*.

1. ALTERNATE-LEAVED STONEWORT.

Plate 26. Fig. 1.

Character of the Species.

Verbena Chinensis.

The Leaves are lanced, placed alternate, and have Footstalks.

Fig. 1. *a b*.

THIS is an Annual, native of China, and flowers in June. The Stalk is downy, and of a faint green. The Leaves are of a pale green, and lightly hairy. The Flowers stand singly at the tops of the Stalk and principal Branches. Their colour is a delicate yellow. Their Rays are numerous and undivided.

2. CLUSTERY STONEWORT.

Plate 26. Fig. 2.

Character of the Species.

Verbena Virginica.

The Flowers crown the Stalk in large, broad clusters: the Leaves are lanced.

Fig. 2. *a b*.

THIS also is an Annual, native of the wet grounds in Virginia: and flowers in August. The Stalk is upright, round, and of a yellowish green. The Leaves are of a deep green, and often brown towards the edges. The Flowers are of a delicate pale yellow.

3. PROCUMBENT STONEWORT.

Plate 26. Fig. 3.

Character of the Species.

Verbena prostrata.

The Stalk leans; the Leaves are lanced and grow in pairs.

Fig. 3. *a b*.

THIS is an Annual, native of the Indies; and flowers from June to August. The Stalk is ribbed, and tinged with red. The Leaves are of a bright green. The Flowers are of a strong yellow. They grow upon short Footstalks from the bosoms of the Leaves, usually two together.

4. LONG-FOOTSTALKED STONEWORT.

Plate 26. Fig. 4.

Character of the Species.

Verbena Clandulacea.

The Flowers stand singly upon very long Footstalks.

Fig. 4. *a b*.

THIS is an Annual, native of Ceylon, and flowers in July. The Stalk is weak; the Leaves are of a deep green; and the Flowers of a perfect gold yellow.

5. WOOLLY STONEWORT.

Plate 26. Fig. 5.

Character of the Species.

Verbena asteroides.

The Leaves are woolly, and the Flowers stand singly.

Fig. 5. *a b*.

THIS is an Annual, native of Surinam, and flowers in August. The Stalk is whitish and ribbed. The Leaves stand in pairs, and are white and woolly. The Flowers are very beautiful; they resemble some of our finest Asters. The disk is yellow; and the Rays are of a violet blue.

6. WHITE STONEWORT.

Plate 26. Fig. 6.

Character of the Species.

Verbena alba.

The Stalk is robust and erect; the Leaves are lanced and serrated, and placed in pairs.

Fig. 6. *a a*.

THIS is a Biennial; native of Virginia, and flowers in August. The Leaves are of a good green, and the Stalk is often stained with crimson; but the Flowers are small and white.

* * THERE are other Stoneweeds which have no Rays, and will have their place in the next Class: Vol. II. part 2, p. 125. The famous Acnella, from whose virtues against the Stone, the Genus received its name, is one of the naked kinds:

G E N U S

G E N U S III.

S K Y - F L O W E R .

C O E L E S T I N A .

Character of the Genus.

The Cup spreads itself at the top; and is composed of two rows of divergent scales: these are lanced, but terminate in an awly point; and are distinguished by a strong green thick rib in their centre.

See Plate 26**. Fig. *o o a b c*.

O F this Genus there is but one known Species: I have named it from the cœlestial blue of its Flower, which exceeds that of any other.

I. O V A L - L E A V D S K Y - F L O W E R .

Character of the Species.

The Leaves are oval, of a firm substance, and slightly covered with short rigid hairs. The Flowers stand on long naked Footstalks.

Fig. 26**. *a b*.

THIS is a perennial woody Plant, native of the Cape of Good Hope, and flowers throughout the year. It bears the open air with us in Summer; and it is then the Flowers shew their true sky tinct. The Green-house preserves it very well through Winter, and it flowers all the time, so as to grace the collection extreamly, though not with its full lustre.

It grows to about three quarters of a yard high; not perfectly upright, but oblique, and branching extreamly, so as to form a very well shaped little bush. Here at Bayswater, I give it the free ground upon a dry hillock all Summer, which it in a manner covers with its spreading shoots. I have counted upon it at one time more than a hundred and eighty Flowers; which, in the midst of a perfectly serene day, have seemed as if they had no colour of their own, but reflected the pure azure of the firmament.

THE Leaves are of a good green; but they get a brownish aspect by the hairs which cover them: the Rays of the Flower turn back when it is fading. The Disk is of a very good yellow.

WE have not had this Plant above seven or eight years in Europe. It has been called a Marygold, and an After. Those who had a mind to refer it to some known Genus, should have seen that it approached much nearer to the *Verbesina*: but an attention to the Cup, the most certain, as well as the most obvious source of generic characters, shews what the former uncertainty seemed also to point out, that the Plant is truly of a Genus distinct from all others.

I CANNOT but recommend to those who would see some of the foreign Plants, which are too tender for our winters, in their natural perfection, the method I have mentioned of giving them the full ground all Summer: I use it for the African *Geraniums*, *Othonnas*, and a great many other of the Green-house kinds. Little hillocks of fresh earth, of two feet and a half diameter, are ranged in a warm dry spot, with a south aspect; and one Plant is shook out of its pot, and placed on the summit of the hill; as soon as the danger of cold nights is over. They grow with great freedom, and flower abundantly. They give a great beauty to the garden all Summer; and, though the Winter destroys them, a succession is easily kept up in the usual way from seeds, or cuttings.

G E N U S IV.

CHAMÆMILE.

ANTHEMIS.

Character of the Genus.

The Cup is hemispheric, and the Scales are linear and nearly equal; they are numerous, and stand compact.

Plate 27. Fig. *a a b*.

a. Those with white Rays.

1. PRICKLY CHAMÆMILE.

Plate 27. Fig. 1.

Character of the Species.

Anthemis cotula.

The Disk of the Flower is large and prickly.

Fig. 1. *a b*.

THIS is an annual weed, as troublesome in the corn fields in Italy as the worst of those that plague the English farmers. It is half a yard high. The Stalk is thick and branched. The Leaves are of a blackish green, The Flowers, which blow from May to August, are large and white, but with a yellow Disk. The pricklyness of this arises from the Chaffs which separate the Seeds: they have hard pointed tops, and wound the fingers.

2. TALL CHAMÆMILE.

Plate 27. Fig. 1.

Character of the Species.

Anthemis altissima.

The Plant is erect; the Flowers are large, and the divisions of the Leaves are hard at the ends.

Fig. 1. *a b*.

THIS is an annual weed, universal among the corn in the southern parts of Europe, and taller than barley at its highest growth. The Stalk is red, upright, branched, and spreading. The Leaves are of a faint green, and the points of their divisions are white and hard, and almost prickly. The Flowers are large and white, and the Chaffs of the Disk have long beards.

3. SEA-SIDE CHAMÆMILE.

Plate 27. Fig. 3.

Character of the Species.

Anthemis maritima.

The Leaves are fleshy and wing'd; and the Leaflets are indented.

Fig. 3. *a a b*.

THE sea-shores of France and Italy are covered often with this spreading Plant, whose innumerable white Flowers seem like snow all summer. The Stalk is weak and branched: the Leaves are of a faint green: they are winged and indented, and thick and juicy. It is a Perennial, and propagates abundantly by Root as well as Seeds.

4. WOOLLY CHAMÆMILE.

Plate 27. Fig. 4.

Character of the Species.

Anthemis tomentosa.

The Cups and Footstalks of the Flowers are woolly.

Fig. 4. *a b*.

THIS is a Grecian Sea Plant, perennial, and full of Flowers a great part of the year. The Stalk is weak, and more than a foot long. The Leaves are of a blue green: and the Footstalks of the Flowers are long, leafy, and covered with a white down.

5. MOTTLED CHAMÆMILE.

Plate 28. Fig. 5.

Character of the Species.

Anthemis mixta.

The Rays are white, but mottled with yellow at the Base: the Leaves are single but jagged.

Fig. 5. *a a b.*

THIS is an annual weed in the corn fields and vineyards of France and Italy, and principally in those near the sea; as also sometimes on the naked sands. The Leaves are of a bluish green. The Plant is not more than a foot and a half high. The Flowers are numerous and large. The Disk is yellow, as in all the other kinds; but it is singular that in this that part of the Rays which joins the receptacle, and is near the Disk, is also yellow. It flowers in July and August.

6. CHIAN CHAMÆMILE.

Plate 28. Fig. 6.

Character of the Species.

Anthemis Chia.

The Footstalks of the Flowers are leafless but woolly: the Leaves are pinnated.

Fig. 6. *a b.*

THIS is an annual; native of the isle of Chio, and flowers all summer. The whole Plant scarce rises to a quarter of a yard in height; the Stalks divide into many Branches, which spread upon the ground; and are thick covered with deep green Leaves. The Flowers stand singly upon long, slender, woolly Footstalks: these rise erect.

7. SWEET CHAMÆMILE.

Plate 28. Fig. 7.

ROMAN CHAMÆMILE.

Character of the Species.

Anthemis nobilis.

The Leaves are subdivided in the winged manner, and their Segments are narrow, sharp pointed, and lightly hairy.

Fig. 7. *a b.*

THIS is the long famous, and in a manner universal, Garden Chamæmile; we have called it Roman, from its supposed peculiar origin in Italy; but it is also a native of our own country, and of all Europe and part of Asia. It is a perennial, low Plant; branching extremely, near the ground, and covering it with thick tufts of fresh green, soft, and fragrant Leaves. It flowers from June to October, and the Flowers are white, with a pale yellow Disk.

THIS is the Chamæmile, whose Flowers are, or should be, used in medicine; but as culture easily renders them double, and they look in that state larger and more beautiful, apothecaries chuse such for their shops; ignorant that in the Disk of the Flower, which becomes obliterated in the double state, resides the principal virtue.

8. FIELD CHAMÆMILE.

Plate 28. Fig. 8.

SCENTLESS MAYWEED.

Character of the Species.

Anthemis arvensis.

The Stalk spreads into wide Branches, and the Disk rises in a Cone.

Fig. 8. *a b.*

THIS is a weed in our corn fields, and covers the bank fences which divide them. It is a biennial Plant, a foot and half high, with a thick, red Stalk, spreading at top into a multitude of scattered arms; and covered with small white Flowers in a long succession. The Leaves are of a fresh green; they have neither good nor ill scent; and there are speary Chaffs upon the Disk between the Flowers and Seeds.

9. FOETID

9. FOETID CHAMÆMILE.

Plate 29. Fig. 9.

STINKING MAYWEED:

Character of the Species.

Anthemis cotula.

The Leaves are recompond in the winged manner: the Stalk is branched and spreading, and the Flowers have a large rising Disk.

Fig. 9. *a a b.*

THIS is an Annual, native of our own waste grounds and dunghills; and from its early flowering, and its disagreeable scent, has been called Stinking Mayweed: but the English vulgar names are very equivocal: the common Fumitory is the Mayweed of many counties. The Plant is two feet high; the Leaves are of a dusky green, and juicy: when bruised they have a rank, ill flavour. The Stalk is round, thick, and green; and at the top spreads into many branches, on which are numerous large, white Flowers.

I HAVE found that the Flowers of this Plant have the virtues of those of Chamæmile in a superior degree.

10. TRIFID CHAMÆMILE.

Plate 29. Fig. 10.

Character of the Species.

Anthemis Cretica.

The Leaves are variously divided, but the extreme Segments are naturally trifid.

Fig. 10. *a b.*

THIS is an Annual, native of Crete and the other Greek islands; and flowers from May to August. It is a foot high. The Stalks are weak; the Leaves spread flat, and are divided into numerous Segments; but the extreme parts naturally break into threes. The Flowers are placed upon long Footstalks; and are white, with a yellow, rising Disk:

11. SIMPLE-LEAV'D CHAMÆMILE.

Plate 29. Fig. 10.

Character of the Species.

Anthemis repanda.

The Leaves are oval and undivided, only crenated and nurlled along the edges.

Fig. 11. *a.*

THIS is a Perennial, native of Spain, and very different from all the rest in its aspect. The Stalk is upright, very little branched, and crowned with several white, slight Flowers with yellow Disks. The Leaves are of a fresh green, and a little downy. It flowers in August.

12. PELLITORY CHAMÆMILE.

Plate 29. Fig. 12.

Character of the Species.

PELLITORY OF SPAIN.

Anthemis pyrethrum dictum.

The Stalk is terminated by a single Flower.

Fig. 1. *a b.*

THIS is an elegant perennial Plant, native of the East, and of some parts of Europe; common to the island of Crete, and to the hills of Italy, to Syria and to Hungary. The Stalk is thick but weak, six or eight inches high; and in June or July is terminated by a single, large, and very specious Flower. The Rays are snowy white, and as it were enameled on the inside; and of a delicate crimson on the outside. The Leaves are of a fresh but not strong green.

THE Root of this Plant is the Pyrethrum, or Pellitory of Spain, of the shops.

a With

b. With yellow Rays.

13. HAIRY CUP'D CHAMÆMILE.

Plate 30. Fig. 13.

Character of the Species.

Anthemis Valentina.

The Divisions of the Leaves are very narrow; and the Cups of the Flowers are hairy.

Fig. 13. a a.

THIS is a Biennial, native of France and Spain, and flowers there from Midsummer to Winter. The Plant is eighteen inches high. The Stalk is red. The Leaves are of a pale green. The Flowers are altogether yellow, and their Cups, which are hoary, look of a greyish green.

14. TRITERNATE CHAMÆMILE.

Plate 30. Fig. 13.

Character of the Species.

Anthemis Americana.

The Leaves are thrice divided, and each division is by threes: the Flowers have very long Footstalks.

Fig. 1. a a a.

THIS is a little Annual, native of the marshy grounds of Jamaica and Barbadoes; and flowers toward the end of Summer. The Stalk is weak and lies upon the ground. The Leaves resemble in a smaller size those of our common Meadow Crowfoot, but with yet more divisions: their colour is a dusky green. The Flowers are small, and of an orange yellow.

15. SHORT-RAY'D CHAMÆMILE.

Plate 30. Fig. 15.

Character of the Species.

Anthemis millefolia.

The Rays are very short: the Flowers stand upon extremely long Footstalks.

Fig. 15. a b.

THIS is a Siberian, a biennial Plant, flowering in damp, sheltered grounds, toward the end of Summer. The Stalk is two feet long; but leans for some part on the ground. The Leaves are of a pale green and an unpleasant scent. The Footstalks of the Flowers rise from the bosoms of the upper Leaves: they are long, slender, and whitish. The Flowers are a pale yellow.

16. TWICE-WING'D CHAMÆMILE.

Plate 30. Fig. 16.

Character of the Species.

Anthemis tinctoria.

The Leaves are winged, and the Leaflets winged again; and they are woolly on the under side.

Fig. 16. a b.

THIS is a perennial spreading Plant of two feet high, native of the German open fields; and it flowers most part of the Summer. The Stalk is often crimson. The Flowers are naturally yellow; but sometimes their Rays are white, except at the Base. This has occasioned some mistake, the Plant in that state having been considered as distinct: but it is the same.

17. BRANCHING-CUPP'D CHAMÆMILE.

Plate 30. Fig. 17.

Character of the Species.

Anthemis Arabica.

The Flower-cups branch out into threes.

Fig. 17. a b.

THIS is an Annual, native of Arabia, and flowers the greatest part of the year. The Stalk is weak, but half a yard in height. The Leaves are sunburnt and tawney. The Flowers are moderately large and yellow; three or four always crown the shoot, two or three rising from the Cup of the original Flower,

G E N U S

G E N U S V.
M A Y W E E D.
C O T U L A.

Character of the Genus.

The Cup has two rows of broad equal expanded Scales, longer than the rays of the Flower.

Plate 31. Fig. *o a b*.

1. D O W N Y M A Y W E E D.

Plate 31. Fig. 1.

Character of the Species.

Fig. 4. *Cotula Turbinata*.

The Leaves are downy, and deeply divided into narrow Segments.

Fig. 1. *a b*.

THIS is an Annual; a low, but very singular little Plant, native of the Cape of Good Hope; the great country for Botanic singularities: but it will bear the open air with us, and ripen Seeds upon our exposed borders. The Stalks are weak; the Leaves are woolly; the Flowers are white, with a yellow Disk; but the most singular Part about them, is a large blue-green Cup, exceeding the Petals in extent. The receptacle naturally swells at its Base, and gives the Bud of the Flower a peculiar form before it opens; sometimes also this turbinated shape continues through the whole time of flowering; but where the Plant is native, the Cup expands in this as well as the other *Cotulas*; and it is the same where it thrives in our gardens. It flowers in June.

2. C L A M M Y M A Y W E E D.

Plate 31. Fig. 2.

Character of the Species.

Cotula viscosa.

The Leaves are smooth and clammy; they are pinnatifid, and the Extream Lobe is large.

Fig. 2. *a b*.

THIS is an Annual, Native of Vera Cruz, with very little beauty, but enough of singularity to recommend it. It flowers in August. The Stalks are weak, and lie upon the Ground: the Leaves stick to the hand, which touches them; the petty Flowers are white, as in the other; but they are yet more over-shadowed by their great green Cup. The Seeds often fail of ripening here.

*** THERE are two other Species of this Genus, but they have naked Flowers, a yellow Disk, without Rays. Our succeeding Class comprehends the naked Kinds; and, as in all similar instances, this Genus will be repeated there to give those Species.

G E N U S VI.

MARYGOLD.

CALENDULA.

Character of the Genus.

The Cup is hollowed, and its Scales are numerous, lanced, sharp-pointed, equal and set thick.

Plate 32. Fig. o a a.

1. ORANGE MARYGOLD.

Plate 32. Fig. 1.

COMMON MARYGOLD.

Character of the Species.

Calendula Officinalis.

The Leaves are lanced, obtuse, and undivided.

Fig. 1. a b.

THIS is an Annual; Native of the South of Europe; the Common Marygold of our Gardens: It flowers in Autumn. Culture makes it double and proliforous; and the Colour also varies, but the Plant is the same.

2. SMALL FLOWERED MARYGOLD.

Plate 32. Fig. 2.

Calendula Hybrida.

Character of the Species.

The Leaves are pinnatifid, and the Stalks are leafy, and thickened at the top.

Fig. 2. a b.

THIS is a Biennial; Native of the Cape of Good Hope; an humble pretty Plant: It flowers in August; bearing the open air with us. The Flowers are crimson on the back, and white within.

3. NAKED STALKED MARYGOLD.

Plate 32. Fig. 3.

Calendula Nudicaulis.

Character of the Species.

The Stalk is wholly destitute of Leaves.

Fig. 3. a.

THIS is also a Native of the Cape; but bears the air with us, and flowers in August: the Flower is very large, and violet-coloured on the outside, but white within.

4. ÆTHIOPIAN MARYGOLD.

Plate 32. Fig. 4.

CAPE MARYGOLD.

Character of the Species.

Calendula Pluvialis.

The Leaves are lanced, and deeply indented, and the Stalk is leafy.

Fig. 4. a b.

THIS is an Annual also; and, though a Native of warm Regions, flowers in the open air with us in July and August. The Plant is weak and unfightly; but the Flowers make amends: Their back is a fine crimson.

5. GRASSY-LEAVED MARYGOLD.

Plate 32. Fig. 5.

Calendula graminifolia.

Character of the Species.

The Stalk is almost naked; the Leaves are linear, and undivided.

Fig. 5. a b.

THIS is an elegant Plant; Native of the same Part of the World with the former; but more valuable, as it is a Perennial, and flowers from May to August. The Flower is delicately crimson on the back, and white within: the Leaves are of a fresh green, and rise in great Tufts.

G E N U S.

G E N U S VII.

DWARF SUNFLOWER.

RUDBECKIA.

Character of the Genus.

The Cups turns back; it has two Rows of oblong, obtuse, similar leafy Scales; and the Disk of the Flower rises high.

Plate 33. Fig. 0. a a.

1. HARSH DWARF SUNFLOWER.

Plate 33. Fig. 1.

Character of the Genus.

Rudbeckia hirta.

The Leaves are equal, and covered with stiff hairs: The Rays are nip'd away at the End.

Fig. 1. a b.

THIS is a Perennial; Native of Virginia, and lives freely in the open Ground with us, flowering from August to October. The Flowers also are very lasting. It is a Foot and a half high. The Leaves are dusky; the Rays yellow, and the high Disk purple.

2. PAIRED-LEAVED DWARF SUNFLOWER.

Plate 33. Fig. 2.

Character of the Species.

Rudbeckia oppositifolia.

The Leaves are oval-lanced: The Rays are split deep in two at the end.

Fig. 2. a b.

THIS is a Perennial; Native of Virginia, and bears the open Air with us. The Plant is two Foot high: the Leaves are smooth; the flowers are yellow with a purple Disk. The Cup is shorter than in all other Species. It flowers in August.

3. CRIMSON DWARF SUNFLOWER.

Plate 33. Fig. 3.

Character of the Species.

Rudbeckia Purpurea.

The Leaves are oval, but swell in the middle and stand alternate. The Rays are split.

Fig. 3. a b.

THIS is a Perennial; Native of Carolina and Virginia, and flowers in August. It grows with us in open Ground; but is not easily encreased: the Seeds not ripening well, and the Root putting out few new Heads. It is two feet and a half high. The Rays are pale crimson, and the rising Disk is purple with a Glow of green and gold: such as we see upon the wings of certain beetles.

4. THREE-LOBED DWARF SUNFLOWER.

Plate 33. Fig. 4.

Character of the Species.

Rudbeckia Triloba.

The lower Leaves are cut into three distinct Parts; those toward the top entire.

Fig. 4. a b.

THIS is a Biennial; Native of Virginia, and lives freely in our Borders. It flowers in August, and the Seed ripens with us. It is two Feet high, and bears many Flowers.

5. LACINIATED DWARF SUNFLOWER.

Plate 33. Fig. 5.

Character of the Species.

Rudbeckia laciniata.

The Leaves are cut and split into many long irregular Divisions.

Fig. 5. a.

THIS is a Perennial, Native of Virginia: a Plant of five feet high; flowering all the latter part of Summer. The Disk as well as Rays is yellow.

G E N U S.

G E N U S VIII.

TICK-SEED.

COREOPSIS.

Character of the Genus.

The Cup has two rows of distant and dissimilar Scales rising from a fleshy Base.

Plate 34. Fig. o. a b c.

1. CLUSTER-LEAVED TICK-SEED.

Plate 34. Fig. 1.

Character of the Species.

Coreopsis Verticillata.

The Leaves are divided into oblong narrow Segments, and surround the Stalk.

Fig. 1. a b.

THIS is a Perennial; Native of Virginia: a Plant of four Feet high, and flowers in August: the Leaves are placed in Pairs; but their Divisions seem to surround the Stalk in Circles, as in the Verticillate Plants. The Flowers are of a delicate yellow, with a purple Disk; very numerous, and very beautiful.

2. TERNATE-LEAVED TICK-SEED.

Plate 34. Fig. 2.

Character of the Species.

Coreopsis Tripteris

The lower Leaves are cut to the Base into three distinct and entire Divisions.

Fig. 2. a.

THIS is a Perennial; a tall, robust Plant of six Feet high, covered with golden Flowers from July to October: It is a Native of North-America, and lives with us freely in the open Air. The Leaves are of a deep green, and the Stalk is extremely branched toward the Top. Though the lower Leaves are composed of three distinct Parts, the upper ones are entire.

3. WHITE TICK-SEED.

Plate 34. Fig. 3.

Character of the Species.

Coreopsis Alba.

The Leaves are formed of three distinct Parts, which are short and serrated.

Fig. 3. a b.

THIS is a Perennial; Native of Santa-Cruz, an humble and a very singular Plant. The Stalks divide into many Branches. The Leaves are deeply serrated, and of a bluish green. The Flowers are white: they consist of a few broad Rays, and have a glow of crimson toward the Centre. It flowers toward the latter end of August.

4. AURICULATED TICK-SEED.

Plate 34. Fig. 4.

Character of the Species.

Coreopsis Auriculata.

The Leaves have an Appendage, or Ear, on each side of their Base.

Fig. 4. a a.

THIS is a Biennial; Native of Virginia; a Plant of two Feet high; divided into many Branches, and covered with fine gold yellow Flowers, from July to September. The upper Leaves are simple: those lower down the Stalk have a pair of Ears at the Base, and in the lowest of all, these are so large, that they appear trifoliate.

G E N U S.

5. LINEAR TICKSEED.

Plate 35. Fig. 5.

Character of the Species.

Coreopsis angustifolia.

The Leaves are simple, narrow, undivided, and all the way of a breadth.

Fig. 5. *a a.*

THIS is a Perennial, native of Virginia; and bears our open air freely, if kept in a place not too wet. The Stalks are usually tinged with brown. They are slender, and less branched than in the other kinds; the Leaves also have, with their natural dusky green, some tinge of brown: the Flowers are numerous, and of a bright yellow. They blow in August.

6. LANCED TICKSEED.

Plate 35. Fig. 6.

Character of the Species.

Coreopsis Lanceolata.

The Leaves are simple, undivided at the edge, oblong, and swelling in the middle.

Fig. 6. *a b.*

THIS is a native of Carolina, a very singular and beautiful Plant, with large golden Flowers, and the inner series of Scales on the Cup so highly coloured, that they seem Rays, tho' short; and give an air of doubleness. Most Authors have joined it with the Bidens; but the Cup in that Genus is simple: in this the double Range is so conspicuous, that it gave origin to the generic distinction, and it was the first species called by the name *Coreopsis*. The Leaves are of a delicate, though simple shape; their colour is a strong green. The Flowers appear in July.

7. CONNATE TICKSEED.

Plate 35. Fig. 7.

Character of the Species.

Coreopsis bidens.

The Leaves grow together at their bases, and the Stalk runs thro' them.

Fig. 7. *a a b.*

THIS is a native of the northern parts of Europe, an Annual; which flowers by the sides of ponds all Autumn. It is the more singular, because all the rest are American; and it has been confounded with the drooping Bidens: but the double row of Scales in the Cup separates it not only from that Species, but from the whole Genus. It is four feet high; the Leaves are of a fresh green, and the Flowers stand erect, and have long Footstalks.

8. DECURRENT TICKSEED.

Plate 35. Fig. 8.

Character of the Species.

Coreopsis Alternifolia.

The Leaves are lanced, serrated, and run down the Stalk.

THIS is a native of Virginia, a Perennial; ten feet high, and flowers late in Autumn. The Leaves are harsh to the touch, and the Flowers are pale yellow.

T

G E N U S

GENUS IX.

HEART-SEED.

SILPHIUM.

Character of the Genus.

The Cup has two rows of dissimilar Scales, the outer row leafy. Plate 36. Fig. 3 a a.

1. HELIANTHOIDE HEART-SEED.

Plate 36. Fig. 1.

Character of the Species.

Silphium helianthoides.

The Leaves grow in pairs on Foot-stalks: they are oblong-oval, and ferrated.

THIS is a Perennial, native of Virginia: a very tall and elegant Plant. The Stalk is six feet high; the Leaves are naturally of a faint green, and usually variegated with blotches of yellow. The Flowers are large, and of a deep strong yellow. They blow from August to November: and from time to time taller Footstalks rise beyond the original Flower.

2. LACINIATED HEART-SEED.

Plate 36. Fig. 2.

Character of the Species.

Silphium laciniatum.

The Leaves are cut into deep segments in the pinnatifid manner. Fig. 5. a b.

THIS is a Perennial, native of North-America, and a wonderfully stately as well as singular Plant. It is ten feet high. The Leaves are of a faint green, and the Flowers of a glorious yellow. It flowers from August to October.

3. TRIFOLIATE HEART-SEED.

Plate 36. Fig. 3.

Character of the Species.

Silphium trifoliatum.

Three rough Leaves grow naturally at each Joint, sometimes four. Fig. 1. a b.

THIS is a Perennial, native of Virginia; a Plant long known in our gardens, flowering all August and September. The Stalk is firm and branched; the Leaves are of a dusky green; the Flowers are delicately yellow.

4. LANCED-LEAVED HEART-SEED.

Plate 36. Fig. 4.

Character of the Species.

Silphium solidaginoides.

The Leaves are lanced and ferrated: they have footstalks and grow in pairs. Fig. 4. a b.

THIS is like the former, a Perennial, native of Virginia; a very fine Plant, flowering all Autumn: the Stalk is firm and variagated, the Leaves are of a fine fresh green, and the Flowers of a bright yellow.

5. ENTIRE-LEAVED HEART-SEED.

Plate 36. Fig. 5.

Character of the Species.

Silphium asteriscus.

The Leaves grow in pairs, without footstalks, and have no indentings. Fig. 5. a b.

THIS is a Perennial, native of Virginia; a very beautiful and robust Plant. The Leaves are of an extremely fine deep green; the Flowers are very large and yellow; they have greatly the aspect of some of the smaller Sunflowers. The Stalks add to the beauty; for they are spotted elegantly with a deep crimson.

ORDER

G E N U S X.

TWIN-WEED.

G E M E L L A.

Character of the Genus.

The Cup has two rows of dissimilar Scales, rising as twins, near each other, and from one fleshy Base. The Rays of the Flower are five.

Plate 36.** Fig. *o a b c.*

Of this Genus there is but one known Species; a tall, upright, and, if not an elegant; at least a most singular Plant.

WINGED TWIN-WEED.

Character of the Species:

The Leaves are winged.

Plate 36.** *a b.*

THIS is an Annual, native of damp ground in Pennsylvania, and other parts of North America; and flowers with us in August. The Plant is two feet and a half high: it has an erect firm Stalk, with thick joints, and deep furrows; naturally of a faint green, but usually sunburnt: and thence tinged red or brown. The Leaves are placed opposite; each is composed of two or three pairs of Leaflets with an odd one at the end: these are of a fresh green, smooth and bright, and have the Footstalk edged. The Flowers are numerous but small: they crown the tops of the Stalk and branches in an irregular manner; and consist each of a yellow Disk, and five white Rays. The Seeds stand first erect, in a kind of cylindric column; but afterwards, as they dry and harden, they diverge, and form a loose round ball. Their continuance in the columnar form is so long, and their spreading afterwards is so uncertain, that they shew in an ill light that distinction which has been established in a Genus somewhat allied to this, from the erect position, or the divergence of the Seeds,

THIS new Genus will prove of great use in the formation of a NATURAL METHOD; the lamented Defideratum in Botany, and the great end and aim of our present undertaking.

IN that method, the progress of which keeps constant, tho' not equal, pace with this our artificial Index, we shall, so far as our limited Faculties may be capable, and the due humility of our nature may devoutly authorize, endeavour to enter into the idea of the great Creator when he made the multitude of plants; and to arrange them in the course wherein they follow one another, according to the order of their formation.

IN this method, so far as our feeble powers and imperfect knowledge may enable us to proceed, we shall find the Genera of Plants following one another in a true regularity; not as imaginary or arbitrary marks distinguish them, but as the several kinds arise above each other by some additional part, or new organization: and between each, to fill the imagined gap, for nature makes none real between Genus and Genus, we shall always find either by newly discovered Species, or by a better observation of the old, some Plant which partakes as it were of the nature and characters of both; standing upon the confines of either territory, and leading, without disunion from one to the other.

ONE of these FRONTIER PLANTS is our *Gemella*: and it may not be amiss to give a sketch of what is purposed to be done hereafter throughout all Vegetable Nature in the present instance.

WE knew before, I. a Genus *BIDENS*, whose Cup is formed of a *single row* of Scales, under which there stands a *Circlet of leafy films*. II. A Genus *COREOPSIS*, in which the Cup has two rows of *distant* Scales, from a fleshy Base, the outer somewhat leafy. And, III. A Genus *SILPHIUM*, in which the two-row'd Cup loses in great part its fleshy Base, and the outer row of Scales is perfectly leafy. Now it is evident that the gradation from the second to the third of these is natural and easy; but it had not appeared before that there was any connection between these two and the first, whose Cup is truly simple. Here we have the Frontier Plant between the *Bidens* and the *Coreopsis*; and we may learn from it the chain of nature. Our *Gemella* has the Circlet of leafy films of the *Bidens* raised into a part and portion of the Cup: It shews therefore what that kind of Circlet is in nature; namely the first advance from a more simple toward a more complex Cup. The Cup of *Bidens* is therefore the extrem, or last of the simple Cup, and that of *Coreopsis* the first of double ones. This *GEMELLA* is the second advance; or the Plant between them. In the order of original nature it stands there, and there it will have its place in our succeeding natural method; in which there will be no distinction of separate or broken parts, under different arrangements, but the course will run on thus;

- I. *BIDENS*, having a Circlet, placed beneath the Scales of its simple Cup.
- II. *GEMELLA*, having the Circlet twinborn, and connected with the inner Scales of the Cup; only making an outer range.
- III. *COREOPSIS*, having the outer range distant and spreading.
- IV. *SILPHIUM*, having the outer range distant and leafy.

THIS is the order of nature in respect of these four Genera, and by this will be brought together Plants which no artificial character connects, tho' they are really allied so closely.

OUR third and fourth *Atractylis*, and the two *Carpesia* in the following Plates, afford like instances; connecting what are called, in artificial methods, different classes; but it is not yet a time to speak of them.

O R D E R IV.

With the general Cup **TILED**, or composed of several series of Scales.

G E N U S I.

S U N F L O W E R.

H E L I A N T H U S.

Character of the Genus.

The Scales are fimilar, and all leafy; they stand loofe, and are waved and curled.

Plate 37. Fig. o. a.

1. SMOOTH SUNFLOWER.

Plate 37. Fig. 1.

Character of the Species.

Helianthus laevis.

The Leaves are lanced, indented, and fsmooth on the surface.

Fig. 1. a.

THIS is a Perennial, native of Virginia; a Plant five feet high; flowering all Autumn. The Leaves are deep green, and the Flowers gold yellow.

2. LINEAR SUNFLOWER.

Plate 37. Fig. 2.

Character of the Species.

Helianthus angustifolius.

The Leaves are rough, narrow, and all the way of equal breadth.

Fig. 2. a.

THIS also is a Perennial, native of Virginia, and flowers from August to October. The Leaves are brownish and uneven; the Flowers are large and of a deep yellow.

3. LONG-ROOTED SUNFLOWER.

Plate 37. Fig. 3.

Character of the Species.

Helianthus strumosus.

The Root is spindled like a Carrot; the Leaves are oval and indented.

THIS also is a Perennial, native of North-America: a vast Plant, ten feet high; with grey green Leaves and very fine yellow, though small Flowers. The Leaves have three great Ribs, and the Stalk fends out many branches.

4. SHORT-RIBBED SUNFLOWER.

Plate 37. Fig. 4.

Character of the Species.

Helianthus decapetalus.

The Leaves are oval, not at all hearted: they have three ribs, which join within the Leaf.

Fig. 4. a b.

THIS is a native of North-America, a Perennial; four feet high, and very elegant: the Stalks are crimson; the Leaves are a deep green, and the Flowers of a perfect gold yellow. The Scales of the Cup are not more than two or three and twenty, and the Rays of the Flower about thirteen. LINNÆUS makes them only ten; but here at Bayeswater, where the Plant is in unmanured ground, and every way in a perfect state of Nature, they are thirteen: The Ribs terminating within the Leaf, as in the generality of Plants, distinguish this from our eighth Species, which it refembles; for there they run back naked.

5. SPREADING SUNFLOWER.

Plate 37. Fig. 5.

Character of the Species.

Helianthus divaricatus.

The Leaves are oval, and without Foot-stalks; the Stalk is scattered over with dewy hairs.

Fig. 5. a b.

THIS is also a Perennial, native of North-America; a Plant of five Feet high, flowering all Autumn. The Leaves are of a dead green, and have three great Ribs: the Flowers are of a deep yellow, and spread in broad heads.

THE VEGETABLE SYSTEM.

6. GIANT SUNFLOWER.

Plate 36. Fig. 6.

Character of the Species.

Helianthus giganteus.

The Leaves are lanced, undivided at the edge, and rough.

Fig. 6. *a b.*

THIS is the tallest of the *Helianthus* kind; it is now thirteen feet high with me: but the Flowers for such a stature are not large: it is a Perennial; native of the country about Quebec, and flowers in October: the Leaves are of a pale green, and rough: the Flowers have numerous Rays, and are of a pale yellow.

7. ANNUAL SUNFLOWER.

Plate 38. Fig. 7.

Character of the Species.

GREAT SUNFLOWER.
Helianthus annuus.

The Leaves are hearted, and their three ribs run naked behind the base.

Fig. 7. *a b.*

THIS is a native of South-America, an Annual; the rest are all perennial, and North-Americans. The Leaves of this are pale; and the ribs, which are naked behind, are thick. The Flower is enormous.

8. LONG-RIB'D SUNFLOWER.

Plate 38. Fig. 8.

PERENNIAL SUNFLOWER.

Character of the Species.

Helianthus multiflorus.

The Leaves are oval, and a little hearted; their ribs run out behind the base.

Fig. 8. *a a b.*

THIS is a Perennial, native of North-America, and has been long known in our gardens by the name of Perennial Sunflower: it easily becomes double by culture, and makes a very good appearance. It flowers from July to November. The Leaves toward the bottom of the stalk are hearted at the base.

9. TUBEROUS SUNFLOWER.

Plate 38. Fig. 9.

Character of the Species.

JERUSALEM ARTICHOAK.
Helianthus tuberosus.

The Leaves are oval, lightly hearted and rough; the root is tuberous.

Fig. 9. *a b.*

THIS is a Perennial, native of South-America, but free to bear the open air with us; it is the Plant which in our kitchen-gardens has the amazing name Jerusalem Artichok. The Stalk is twelve feet high; the Leaves are pale; and the Flowers are small: the Root is formed of numerous thick knobs.

10. RED-DISKED SUNFLOWER.

Plate 38. Fig. 10.

Character of the Species.

Helianthus atrorubens.

The Scales of the Cup are very little waved or spread: the Leaves are oval.

Fig. 10. *a b.*

THIS is also a Perennial, native of North-America; a Plant of five feet high, flowering from August to November. The Leaves are pale; the Flowers are yellow, but have a deep crimson Disk.

*** THE Cup is singular; it just preserves the *Helianthus* character: and this is the Plant which in the method of Nature connects the *Helianthus* and *Buphthalmum*.

G E N U S

G E N U S II.

O X - E Y E.

BUPHTHALMUM.

Character of the Genus.

The Scales of the Cup are long and leafy : they stand close, upright, simple, and compact.

Fig. 39. *o a a*.

1. HELIANTHOIDE OX-EYE.

Plate 39. Fig. 1.

Character of the Species.

Bupthalmum helianthoides.

The Leaves are hearted, and have one side shorter at the base. They have three Ribs, and are waved.

Fig. 1. *a a*.

THIS singular Plant is the plain Species, by which Nature, who connects all genera, when we have opportunities of knowing the Plants, unites the *Helianthus* and *Bupthalmum*. In the last *Helianthus*, the leafy Scales of the Cup were waved but little, and stood nearly close, in this which is the first of the *Bupthalmums*, the Scales have lost that little undulation, and stand quite close ; the Cup has therefore formed its full distinction.

THIS is a beautiful as well as singular Plant ; a Perennial, native of North-America, with deep green Leaves, roughened by a few scattered hairs, and reddish stalks, whose branching heads are covered with large yellow Flowers.

2. DOWNY OX-EYE.

Plate 39. Fig. 2.

Character of the Species.

Bupthalmum falicifolium.

The Leaves are lanced, lightly ferrated, and downy.

Fig. 2. *a b*.

WE are returned to Europe : the *Helianthus*'s are all Americans ; and even the connecting Plant, and that which leads the way into this Genus : but the next step brings us home. This is a native of Germany and of the South of France, where it gilds, as it were, the shadowy bottoms of the hills with its innumerable Flowers all the latter part of Summer. The Stalk is firm and pale ; the Leaves are of a greyish green, and the Flowers beautifully yellow. It lives in our open borders with little care, and flowers in vast profusion.

3. GLOSSY-LEAVED OX-EYE.

Plate 39. Fig. 3.

Character of the Species.

Bupthalmum grandiflorum.

The Leaves are lanced, dented, and perfectly smooth.

Fig. 3. *a b*.

THIS also is a Perennial, native of the European hills, and flowers in vast abundance in our open borders. The Plant is two feet high ; the Stalks are hard, green, but little branched, and leafy. The Leaves are of a glossy green : the Flowers are very large and yellow ; but the Rays are narrow, and there is a natural openness between them, which greatly hurts the full look of the Flower.

* * I HAVE this Plant at Baysewater with the Leaf undivided at the edge, but it is merely a variety, no distinction of Species.

G E N U S III.

B O I L - W E E D .

B U B O N I U M .

Character of the Genus.

The Scales of the Cup are dissimilar, and the lower Range is long and leafy.

Plate 40. Fig. o. a.

It is the custom to unite the Plants which compose this Genus with the Bupthalmum; but the distinctive character is absolute: the name we have here given the Genus is as old as the first Naturalists; and Dioscorides has ascertained the Plants to which it then belonged: he describes accurately the leafy range of Scales: he says they are small Leaves radiated as a Star.

1. L A N C E D B O I L W E E D .

Plate 40. Fig. 1.

Character of the Species.

Bupthalmum spinosum.

The Leaves are lanced, and the long Scales of the Cup are sharp-pointed.

Fig. 1. a b.

This is an Annual, a very singular Plant, native of the way-sides and borders of fields, in all the southern Europe. It is two feet high; the Leaves embrace the Stalk at their Base; they are numerous, and of a coarse green. The Flowers are yellow, and their surrounding star is of a dusky green. It flowers in August.

*** THIS is the particular *Bubonium* of Dioscorides. It is of importance to be sure of it, because its virtues, as an astringent, are very great. If any doubt, because he adds *ωαγόπυον* to the epithets of the Flower; let it be observed, the antients attributed the same colour to the swan; they meant only bright and glowing by the word; and Dioscorides himself has called it also yellow.

2. S E S S I L E - F L O W E R E D B O I L W E E D .

Plate 40. Fig. 2.

Character of the Species.

Bupthalmum aquaticum.

The Flowers stand close in the wings of the Branches, and the long Scales of the Cup are obtuse.

Fig. 2. a b.

This also is an Annual, a little but very pretty Plant; native of the South of Europe, and common also to the East. The Stalks lean; the Leaves are of a pale, but not unpleasing green: the Flowers which sit close in the bosoms of the Shoots are delicately yellow: it blows in August.

3. F O O T - S T A L K E D B O I L W E E D .

Plate 40. Fig. 3.

Character of the Species.

Bupthalmum maritimum.

The Flowers terminate the Stalks and Branches, and the long Scales of the Cup are rounded at the end.

Fig. 3. a b.

This is an Annual, native of the sea-coasts of Sicily, Italy, and France; the Stalks lie on the ground, and are woody at the Base. The Leaves are delicately hoary, and the Flowers of a gold yellow. It flowers in August.

4. W O O D Y B O I L W E E D .

Plate 40. Fig. 4.

Character of the Species.

Bupthalmum frutescens.

The Leaves are lanced, and there are two teeth on each of their Footstalks.

Fig. 4. a b.

This is a Perennial, native of Jamaica; the Stem is brown; the Leaves are white and silky; the Flowers appear in July, and are yellow. We are not to wonder at the woody Stalk in this, the preceding species has it also, though an Annual.

G E N U S

G E N U S IV.

E L F - W O R T.

I N U L A.

Character of the Genus.

The Scales are narrow ; they stand loose, and the lowest Range is slightly leafy.

Plate 41. Fig. 1. *a b*.

1. WRINKLED ELFWORT.

Plate 41. Fig. 1.

ELECAMPANE.

Character of the Species.

Inula Helenium dicta.

The Leaves are deeply wrinkled, and woolly underneath.

Fig. 1. *a b*.

THIS is a Perennial, native of Holland and Germany ; a robust rough looking Plant, four feet high, with numerous and specious golden Flowers : the Leaves are pale, and the Stalk is usually purplish. It flowers in August. Its excellence, as a Medicine in diseases of the breast, led our Ancestors to cultivate it universally in their Gardens ; and from the abundance of it now growing in such ground converted to other uses, it is generally supposed a native of our kingdom.

2. FEW - FLOWERED ELFWORT.

Plate 41. Fig. 2.

Character of the Species.

Inula odora.

The radical Leaves are oval, and those on the Stalk are lanced, amplexicaul, and serrated.

Fig. 2. *a b*.

THIS also is a Perennial, a native of the southern parts of Europe universally ; flowering from July to October. The Stalk is red ; the Leaves are hairy and of a pale green. The Flowers are few ; but they are large, and of a pale tho' delicate yellow.

3. WOOLLY ELFWORT.

Plate 41. Fig. 3.

Character of the Species.

Inula oculus Christi dicta.

The Leaves are oblong and undivided, and the whole Plant is woolly.

Fig. 3. *a b*.

THIS is a Perennial, native of Germany ; a hardy Plant, flowering all Autumn. The Stalk is woolly, and divides into many branches at the top. The Leaves are covered with a white downy matter : they embrace the Stalk, and have an undivided edge. The Flowers are large, and of a strong yellow.

4. SAWED - LEAV'D ELFWORT.

Plate 41. Fig. 4.

Character of the Species.

Inula Britannica.

The Leaves are sharply sawed at the edge, lanced, and joined to the Stalk by broad Base.

Fig. 4. *a b*.

THIS is a Perennial, native of Germany ; a tall branching Plant, covered at the top with handsome yellow Flowers all Autumn. The Leaves are of a good green, and smooth on the upper side ; pale and downy below. The Root creeps almost upon the surface of the ground.

5. CLAMMY

5. CLAMMY ELFWORT.

Plate 42. Fig. 6.

Character of the Species.

Inula dyfenterica.

The Scales of the Cup are remarkably narrow.

Fig. 6. *a a.*

THIS is a Perennial, native of our own kingdom, and covers the ditch banks in many places. It is a foot and a half high : the Leaves are whitish, soft to the touch and clammy. The Stalk is covered with woolly Hairs : the Flowers are numerous, and of a very bright yellow : they blow from August to November, and cover the tops of the Plant in great numbers.

6. HALF NAKED ELFWORT.

Plate 42. Fig. 6.

Character of the Species.

Inula pulicaria.

The Leaves are waved at the edge, and the Stalk leans.

Fig. 6. *a b.*

THIS is an Annual, a little dirty-looking and very inconsiderable Plant, frequent in our wet Clays ; and flowers from July to September. It is scarce ten inches high. The Stalk is of a dusky brick colour : the Leaves of a brown green ; and the Flowers not conspicuous, though they are large enough ; for they have scarce any Rays, and are of a very dusky yellow : there is abundance both of this and the preceding, in the new Road from Shepherd's-Bush to Hammermith.

7. RIDG'D-STALKED ELFWORT.

Plate 42. Fig. 7.

Character of the Species.

Inula Salicina.

The Branches are highly ridg'd and angulated ; the Leaves are smooth on the surface ; but have a rugged Edge.

Fig. 7. *a b.*

THIS is a Perennial, common to the northern nations of Europe except this, and flowers on the edges of bogs, and of the Dutch dykes all Autumn. The Stalk is smooth at the Base and reddish ; the young Shoots only are angulated ; the Leaves are of a fine strong green : the Flowers are large, and of a very fine yellow.

8. HARSH-LEAVED ELFWORT.

Plate 42. Fig. 8.

Character of the Species.

Inula hirta.

The Leaves are covered with short upright bristles ; the Stalks are hairy and round.

Fig. 8. *a b.*

THIS is a Perennial, common in Germany and Switzerland at the bottom of hills, and in damp shaded ground : it flowers in August. The Stalk is whitish ; the Leaves are of a grey green, a coarse aspect, and not only rough, but harsh to the touch, [from the firmness of the Hairs scattered thick over them, which are like so many bristles. They have large Ribs, and stand drooping. The Flowers are yellow.

9. CURLED

9. CURLED ELFWORT.

Plate 43. Fig. 9.

Character of the Species.

Inula Germanica.

The Leaves are lanced, and curled back at the Edge: the Flowers are clustered.

Fig. 9. *ab.*

THIS is a Perennial, native of the northern Parts of Europe, and of Siberia: it is a robust rough looking Plant, of four feet high, and flowers in damp Soils from July till Winter. The Leaves are of a brownish green, and rough. The Flowers are small and yellow; but they appear conspicuous from their number, and somewhat singular from their disposition.

10. NERVOUS ELFWORT.

Plate 43. Fig. 10.

Character of the Species.

Inula ensifolia

The Leaves are high-rib'd; linear, but pointed; and the Stalk bears but two or three Flowers.

Fig. 10. *ab.*

THIS is a Perennial, native of Germany; an elegant Plant of two feet high; flowering by the sides of Woods, and among slight Thickets, from August to October. The Stalk is red toward the ground; the Leaves are of a strong and glossy green. The Flowers are large and yellow: there usually are but two or three on a Stalk, sometimes only one; but Culture gives four or five.

11. THREE POINTED ELFWORT.

Plate 43. Fig. 11.

Character of the Species.

Inula crithmoides.

The Leaves are narrow, fleshy, and divided into three points at the End.

Fig. 11. *a.*

THIS is a native of our own Country; a Perennial sea-side Plant of great singularity and extreme beauty. It flowers from June to October: it is a juicy tender looking Herb of a yard high. The Leaves are bluish, and the Flowers are of a gold yellow, very large and delicate. We have a great deal of it near Malden in Essex, and it is very common in Wales.

12. ONE FLOWERED ELFWORT.

Plate 43. Fig. 12.

Character of the Species.

Inula provincialis.

The lower Leaves are oval; the others lanced and ferrated; and the Stalk supports but one Flower.

Fig. 12. *abc.*

THIS is a Perennial, native of Switzerland, and some parts of France, and flowers in August. The Stalk is about a foot high, and is crowned with only one vast yellow Flower: The Leaves are of a good green above, but hoary underneath.

13. WOOLLY ELFWORT.

Plate 43. Fig. 13.

Character of the Species.

Inula Montana.

The Leaves are lanced, undivided at the edge, and woolly.

Fig. 13. *ab.*

THIS also is a Perennial, native of Switzerland, a very elegant Plant. The Leaves are white and cottony: the Flower is large, and of a gold yellow. Often there is only one on the Plant, rarely more than two.

G E N U S V.

CORN MARYGOLD.

CHRYSANTHEMUM.

Character of the Genus.

The Cup is hemispheric : the Scales stand close : the outer Ranges are smallest ; and those of the innermost Series have filmy edges.

Plate 44. Fig. o. a b c.

1. TRIFID CORN MARYGOLD.

Plate 44. Fig. 1.

Character of the Species.

Chrysanthemum frutescens.

The Leaves are narrow, and cut into three irregular Points at the end.

Fig. 1. a.

THIS is a delicate Plant, native of the Canary Islands, where it flowers in great profusion all the summer. The bottoms of the Stems are brown and woody : the rest is green and tender. The Leaves are of a faint but elegant green : the Flowers are snow white and very pretty. With us it requires the green-house in winter.

2. DEEP-CUT CORN MARYGOLD. GREAT DAISY.

Plate 44. Fig. 2.

Character of the Species.

Chrysanthemum serotinum.

The Leaves are cut so deep, they seem jagged ; they are lanced and pointed.

Fig. 2. a.

THIS is an old Inhabitant of our gardens ; but where it is a native none knows ; perhaps it is one of the remote Americans from the inland country. It flowers in September : the Stalk is firm ; the Leaves are of a strong green ; and the Flowers are very large and white.

3. AMPLEXICAUL CORN MARYGOLD.

Plate 44. Fig. 3.

Character of the Species.

Chrysanthemum leucanthemum.

The Leaves embrace the Stalk : they are oblong, fawed toward the top, and dented below.

Fig. 3. a b.

THIS is a Perennial, native of our pastures, the Plant we have been used to call the Great Daisy. It is a foot and a half high. The Leaves are of a good green ; the Stalk is angulated, and the Flowers are large and snow white. It blows in June, and is very common.

4. SPATULA'D CORN MARYGOLD.

Plate 44. Fig. 4.

Character of the Species.

Chrysanthemum montanum.

The lower Leaves are spatula'd ; the upper linear.

Fig. 4. a b.

THIS is a Biennial, native of the south of France ; a very singular and pretty Plant ; flowering from June to August. The lower Leaves are of the true spatula form, round at the end, with a flat Base : those a little higher are lanced, and the top ones linear. All are of a pale, but fresh green ; and the Flowers are beautifully white.

5. GRASSY CORN MARYGOLD.

Plate 44. Fig. 5.

Character of the Species.

Chrysanthemum graminifolium.

The Leaves are long, narrow, and perfectly grassy.

Fig. 5. a b.

THIS is a Perennial, native of Montpelier ; a pretty little Plant, flowering in July. The Leaves are of a pale green, and the Flowers snow white.

6. P A L-

6. PALMATED CORN MARYGOLD.

Plate 45. Fig. 6.

Character of the Species.

Chrysanthemum Monspelienfe.

The lower Leaves are palmated : those on the Stalk are pinnatifid, and deep jagged.

Fig. 6. *a b.*

THIS is a Perennial, native of the south of France, common by the sides of their vineyards; and flowers in August. The Stalk is tinged with brown : the Leaves are of a faint green, smooth, and delicately cut : the Flowers are large and white ; they cover the branchy top of the Plant for a long time.

7. PINNATIFID CORN MARYGOLD.

Plate 45. Fig. 7.

Character of the Species.

Chrysanthemum Alpinum.

The Leaves are regularly pinnatifid : the Stalk supports only one Flower.

Fig. 7. *a b.*

THIS is a Perennial, native of Switzerland, and many other parts of Europe. The Stalk is green and weak : the Leaves are of a fine strong green, with a tinge of bluish. The Flowers are of a delicate white, and stand singly at the tops of the Branches.

8. OVAL-LEAVED CORN MARYGOLD.

Plate 45. Fig. 8.

Character of the Species.

Chrysanthemum Indicum.

The Leaves are oval ; but deeply waved, and sometimes cut in on the edges.

Fig. 8. *a b.*

THIS is a native of Ceylon ; but bears the air in our open ground, and by Culture becomes very beautiful ; the Flower growing double, and the Leaves more waved and more divided ; inasmuch, as in some Plants to resemble those of our common Hawthorn. In this state also their edges become hard, and the Points of the Indentings prickly. The Leaves are of a glossy bluish green : the Stalks are yellowish : the Flowers are yellow, in the state of Nature. They are not large, but of a very good colour ; but by Culture they are rendered bigger, double, quilled, and waved in the same manner as the Tagetes and the Daisy.

9. WEDGE-LEAVED CORN MARYGOLD.

Plate 45. Fig. 9.

Character of the Species.

Chrysanthemum arcticum.

The Leaves are broadest at the end, and cut there into deep divisions, growing smaller all the way down to the Base.

Fig. 9. *a.*

THIS is a Perennial, a weak Plant, native of North-America, and flowers in September : The Leaves are fleshy, and of a bluish green ; the Stalks trail on the ground, and are reddish : the Flowers terminate them and their several Branches. They stand on hairy Footstalks, and are large and of a beautiful yellow.

10. G L A-

10. GLAUCOUS CORN MARYGOLD.

Plate 46. Fig. 10.

Character of the Species.

Chrysanthemum segetum.

The Leaves are deeply jagged, and embrace the Stalk at their base.

Fig. 10. a b.

THIS is an Annual, extremely common in our Corn-fields; and, though a troublesome one to the farmer, is a very handsome Plant. It is two feet high; the Stalks and Leaves are of a remarkable blue green. The Flowers are large and gold yellow: it blows in August. This Plant by Culture may be rendered double, and has a very good appearance.

11. MULTIFID CORN MARYGOLD.

Plate 46. Fig. 11.

Character of the Species.

Chrysanthemum coronarium.

The Leaves are pinnatifid, and cut into numerous Segments, which grow broad at the end.

Fig. 11. a b.

THIS is an Annual, native of Crete and Sicily, and has very long been cultivated in our Gardens, under the name of Candy Corn-Marigold. The Stalk is grey; the Leaves are of bluish green: the Flowers are large and of a very fine yellow: they easily become double by Culture.

12. CLUSTERY CORN MARYGOLD.

Plate 46. Fig. 12.

Character of the Species.

Chrysanthemum corymbosum.

The Leaves are winged and jagged; the Flowers crown the Stalk in a broad cluster.

Fig. 12. a b.

THIS is a Perennial, native of Germany and Switzerland; a tall robust Plant, flowering late in Autumn. The Stalk is often crimson; the Leaves are of a fresh and fine green: the Flowers of a strong yellow.

13. TWICE-WINGED CORN MARYGOLD.

Plate 46. Fig. 13.

Character of the Species.

Chrysanthemum bipinnatum.

The Leaves are hairy; winged; and the divisions winged and cut again.

Fig. 13. a b.

THIS is a Perennial, native of Siberia; a robust Plant, flowering at the latter end of Autumn. The Stalk is brownish: the Leaves are of a deep dusky green; and the Flowers of a strong yellow.

14. PRICKLY CORN MARYGOLD.

Plate 46. Fig. 14.

Character of the Species.

Chrysanthemum flosculosum.

The Leaves are edged with a kind of weak Prickles.

Fig. 14. a.

THIS is an Annual, native of Africa; a singular and not inelegant Plant. The Stalk is a foot and a half high, and of a pale green; the Leaves are of a fine deep, but clear green; and the Flowers have slight Rays, and a yellow large Disk. Often the Rays are wanting, either in part, or intirely. In this state MORISON and ALPINUS have described it: and it will have a place also under our next Class.

GENUS

G E N U S V.

T R I D A X.

Character of the Genus.

The Cup is cylindric: the Scales are similar, erect, egg'd, and sharp pointed.

Plate 47. *a. a b.*

OF this Genus we know only a single Species.

1. D E C U M B E N T T R I D A X.

Plate 47. Fig. 1.

Character of the Species.

Tridax procumbens.

The Stalk leans, and the Leaves stand in pairs.

Fig. 1. *a b.*

THIS is a Perennial, a small but a very delicate and singular Plant, native of Vera Cruz. It flowers in August. The Root creeps, and the Stalk, as it first grows from it, lies upon the ground. The Leaves are of a very fine green, but often tinged with brown. The Stalk seldom rises to more than a foot high, and supports only a single Flower: but this is very beautiful; it is of the Aster form, but of the fine Orange colour of our deepest Marigolds. Its growth is particular: its Footstalk rises from the top of the main stem: yet is not its proper termination, though it appears so. It grows from the bosom of one of the upper pair of Leaves, the Stalk terminating in a Bud by its side. As the Flower fades, this Bud grows, and gives the Plant another aspect. This is represented in the two Stems, Fig. 1. No. 1 expressing the Plant when the Flower first opens, and only a Bud is seen by it, No. 2. When the Flower is faded, and the Shoot is risen to some length.

G E N U S VI.

G O R T E R A.

Character of the Genus.

The Scales of the Cup terminate in prickly Points.

Plate 47. *a a a.*

THIS also is a Genus, of which we know but one Species.

H A I R Y G O R T E R A.

Character of the Species.

Gortera perforata.

The Leaves are lanced and obtuse: the Cup has long Spines.

THIS is a Plant altogether singular, and demanding of right a new name and new place, in the arrangement of the radiated kinds. The Stalk is round, hairy, upright, tinged with brown, and divided into numerous Branches. The Leaves are lanced, very hairy, obtuse, and of a brown green. The Flowers grow at the tops of the Branches; and the first of them naturally appears on the Summit of the main Stalk: but young Branches shoot from this, which exceed it in height; and thus the whole Head becomes bushy. The Flowers are yellow, and the Spines of the Cup which surround them are brown.

G E N U S VII.
A S T E R.

Character of the Genus.

The Scales are of a leafy Substance ; and those of the lowest Range throw their Points outward.

Plate 48. *a. a b.*

THE Asters are so numerous, that it will be useful to subdivide them under two arrangements, according to certain absolute and obvious distinctions.

SUCH may be found in the relation or distinction between the Scales of the Cup and the Leaves of the Plant.

IN some Species the Scales of the Cup are continued down the Footstalks of the Flower, but in a state of Degradation into a more perfectly leafy matter, and an enlarged form ; till they meet the uppermost Leaves of the Stalk, and are undistinguishable from them. These we shall call ASTERS WITH DEGRADATING SCALES.

IN others the Scales of the Cups are kept perfectly distinct from the Leaves of the Plant. These we shall call ASTERS WITH THEIR LEAVES AND CUPS DISTINCT.

A S T E R S.

A R R A N G E M E N T I.

Those with degradating Scales.

1. D R O O P I N G - L E A V D A S T E R.

Plate 48. Fig. 1.

Character of the Species.

After grandiflorus.

The Leaves are lanced, and hang drooping.

THIS is a native of North-America, a very handsome Plant of a yard high ; a Perennial, flowering from September till Winter checks it. The Leaves are rough, and of a brownish green ; the Stalk is brown, and often blotched with crimson. The Flowers are of a delicate pale violet colour : and the Points of the Scales of their Cups are usually brown.

2. C U R L ' D - L E A V D A S T E R.

Plate 48. Fig. 2.

Character of the Species.

After reflexus.

The Leaves are oval, edged with brown, and curl'd back.

Fig. 2. *a.*

THIS is a specious Æthiopian Plant, which covers the burnt sands in many places, with its spreading weak, though almost woody Branches, and shews its gorgeous Flowers innumera- bly to the fierce Sun without the least loss of lustre. It grows to a yard high. The Leaves are of a dusky green ; they curl down, and are edged with a brown hard divided Membrane. Nothing can exceed the Flowers ; their size is vast, and their Colour a deep purple.

3. C H I N A A S T E R.

Plate 48. Fig. 3.

Character of the Species.

After Chinenfis.

The Leaves are oval, angulated, indented, and placed on Footstalks.

Fig 3. *a.*

THIS is an Annual, native of China ; and, tho' a low Plant, is superior to all the others in the size and beauty of the Flower. It blows in August, and will last till November. The Leaves are of a fresh green. The Flowers naturally crimson ; but often white or purple.

4. U M B R E L-

4. UMBRELLA'D ASTER.

Plate 49. Fig. 4.

Character of the Species.

After fedi foliis.

The Leaves are linear and fleshy; the Flowers grow in the umbrella form.

Fig. 4. a b.

THIS is an European, a Perennial; a Plant of great singularity and beauty: It is frequent by the rivers and lakes in Germany, and on damp shaded ground in the south of France: with us, it will live in open ground, in almost any soil: but we should give it a damp bed, not too open to the south Sun. In this kind of ground with me at Bayeswater its Umbel spreads to half a yard in breadth, and appears very elegant and particular among the best of the American and Indian Asters.

THE Plant is two feet and a half high. The Stem is simple, upright, firm, and brown. The Leaves stand thick; they are of a fleshy substance, and fresh green colour: they are linear, or at the utmost, have very little swelling in the middle, and are perfectly undivided at the edge. The Flowers are large, and of a very delicate crimson. It blows from August to October.

5. SCATTERY ASTER.

Plate 49. Fig. 5.

Character of the Species.

After lævis.

The Leaves are smooth, lanced, and ferrated: the Flowers stand at distances.

Fig. 5. a b.

THIS is a Perennial, native of North-America, where Asters are most numerous; and is absolutely distinct in its habit from them all. The Plant is near a yard high: its Stalk is slender, but very firm, angulated, and of a dusky green. The Leaves have no Footstalks: their colour is a deep but not obscure green: they stand singly, and at considerable distances on the Stalk. They are perfectly smooth. The Flowers are large, and of a very delicate colour, between crimson and violet. They stand in a spreading, loose, irregular cluster.

6. RED-DISK'D ASTER.

Plate 49. Fig. 6.

Character of the Species.

After mutabilis.

The Leaves are lanced: the Cup spreads very much at the Base, and the Disk when full blown, is crimson.

Fig. 1. a b.

THIS is a Perennial, a North American, and a very beautiful kind. The Plant is five feet high; the Stalk is firm, brown, and divided into innumerable branches. The Leaves are of a very deep green, and the young Shoots are pale. The Flowers stand in vast abundance and beauty on the top of all the branches. They are moderately large, and their natural colour is a deep violet blue; but they vary, not only from Culture, but on the wild Plant, to pale blue, flesh coloured, and white. In general, the opener the ground where the Plant grows, the deeper is the Colour of its Flowers: and this is the Case also in the others.

7. CLUSTERY ASTER.

Plate 50. Fig. 7.

Character of the Species.

After Tradescanti.

The Leaves are oblong, dented, and swelling a little in the middle. The Flowers form a wild Cluster.

Fig. 6. *a b*.

THIS is a Perennial, native of North-America, and was one of the first brought over into our Gardens. The Stalk is thick, brown, and welted with fine small leafy Ridges. The Leaves are of a deep and unpleasant green; the Branches are numerous, very irregularly disposed, and thick set with small Leaves. The Flowers stand on the Divisions of the upper Branches; which are almost innumerable, and form a vast Cluster: they begin to blow at the latter end of September, and last till the frost.

8. BROAD-HEADED ASTER.

Plate 50. Fig. 8.

Character of the Species.

After Novi Belgii.

The Leaves are broad, lanced, and notched. The Flowers form a broad open Head.

THIS is a Perennial, a native of Virginia, and is not one of the least elegant of the Aster family. It loves a damp soil, and flowers from the beginning of September to Winter. The Leaves are of a deep green, broad, lanced, and serrated about the middle: they adhere to the Stalks by broad Bases, having no Footstalks. The Stalk is dusky, and toward the bottom brown. The top is divided into a multitude of spreading Branches; and on each of all their divisions stands one flower, and no more: they are therefore kept at a distance, and naturally spread into a broad head. They are large, and their colour is a pale violet with a tinge of crimson.

9. LONG-SPIKED ASTER.

Plate 50. Fig. 9.

Character of the Species.

After tenui folius.

The Leaves are linear, thin, and undivided. The Flowers stand in long Spikes.

Fig. 9. *a b*.

THIS is another of the vast family of North-American perennial Asters. It is a native of the damp thickets of New-England, and flowers from September to the beginning of November. Its aspect is somewhat singular among the Asters; and the colour of its Flowers is different from most, and very pretty; they are of a pearly hue, with some fine blue among it, and this principally toward the points of the Rays. The Plant is not more than two feet and a half high. The Stalks are slender, but firm and tough, and their colour is a faint green. The Leaves are of a fine green; they are smooth, glossy, and have scarce any thickness. The Branches are not numerous; they have a handsome number of Flowers growing in long single series on them: and the Scales of the Cup in a very evident manner run down their Footstalks and meet the Leaves.

10. WAVY LEAVED ASTER.

Plate 51. Fig. 10.

Character of the Species.

After undulatus.

The Leaves are wavy, hearted, and lanced: the Flowers rise in a lofty Spike.

Fig. 10. *ab*.

THIS is a native of North-America, a tall perennial Plant, with innumerable Flowers which blow in September. The Stalk is brown, and a little ridg'd: the Leaves have no Footstalks: they are of a deep green, and beautifully waved, and folded at the edges. The Flowers are small; their Colour is a delicate blue. They would be less conspicuous by their size than those of most of the Asters: but the amazing number of them makes ample amends for that defect. They grow in a kind of tower, and cover the whole top of the Plant so perfectly, as at a distance, to resemble one vast mass of some blue light matter.

11. HAIRY ASTER.

Plate 51. Fig. 11.

Character of the Species.

After Novæ Angliæ.

The Leaves are lanced, hairy, and half embrace the Stalk.

Fig. 11. *a*.

THIS is a tall and very majestic Plant, a Perennial, and native, as most of the others, of North-America. The Stalk is brown, rugged, and five feet high, or more. The Leaves are of a pale but brownish green, and hairy: the Flowers are very large and beautiful; they are blue; they stand loose on the tops of the Shoots and Branches, and make a very great appearance, at the late time of their blowing, which is hardly till October.

12. HEATHY ASTER.

Plate 51. Fig. 12.

Character of the Species.

After Ericoides.

The Flowers rise in long Clusters: the Leaves are linear, and undivided.

Fig. 12. *ab*.

THIS is another of the American Asters, a Perennial, flowering with us in vast profusion late in Autumn. The Stalk is upright, firm, reddish, and four feet high. The Leaves are of a delicate green, but often tinged with brown. The Flowers are small and stand close in long Spikes; their Colour when they stand in the free air is singular, it is crimson without any tinge of blue.

13. RACEMOSE ASTER.

Plate 52. Fig. 43.

Character of the Species.

After concolor.

The Stalk is undivided ; the Flowers stand in a kind of a Spike : the Leaves are oval, and hard to the touch.

Fig. 13. *a b*.

THIS very singular Aster is of the common country of the west, the North-American continent ; and it flowers with the earliest toward the end of August. It seems as if Nature, sporting in this vast family, intended to make the regular gradation between the amazingly divided and branched Stalks of some of the preceding kinds ; and the very simple structure of the following : Many of those bear two hundred Flowers, upon divers leafed boughs that has its simple Stalk crowned only with one. This Species seems the Link connecting those extremes, having without any division, yet a considerable number of Flowers.

THE Stalk is brown, about two feet high, and usually undivided, and destitute of all Branches. The Leaves are of a dusky brownish green, hard, and harsh to the touch. The Flowers are crimson, with scarce any tinge of blue ; and often the a cast appears upon the Disk, but not always.

14. ONE FLOWER'D ASTER.

Plate 52. Fig. 14.

Character of the Species.

After rigidus.

One Flower terminates the Stalk ; the Leaves are linear and harsh.

Fig. 14. *a b*.

THIS is of the same origin with the rest, a North-American, and most frequent at the back of our settlements in Virginia, where it rises among thickets, and flowers all the latter end of Summer. The Stalk is brown and weak, yet hard, and in a manner woody : the Leaves are brownish, harsh, and hard to the touch. One vast crimson Flower grows on the summit of the Stalk ; and its Cup is remarkably thick.

15. SUBLINEAR ASTER.

Plate 52. Fig. 15.

Character of the Species.

After Linariæ foliis.

The Leaves are nearly linear, but pointed ; the Flowers are few.

Fig. 15. *a b*.

THIS is a native of Pensilvania and Virginia ; a very beautiful Species, flowering toward the beginning of October. The Stalk is hard and brown, or sometimes reddish. The Leaves are of a dusky green, rough, and sharp pointed. The Flowers are of a delicate deep crimson ; and the Scales of their Cups in a very apparent manner degenerate on the lower part into Leaves, and run down the Footstalks.

16. INDIAN

16. INDIAN ASTER.

Plate 53. Fig. 16.

Character of the Species.

After Indicus.

The Branches spread in a wild scattered manner: the Leaves are oblong, oval, and ferrated.

Fig. 16. *a b*.

THIS is a Biennial, native of China, a Plant distinguished by its habit and general appearance from all the others. The Stalk is naturally crimson: the Leaves are of a fine fresh green, but the lower ones intirely, and those upon the Stalk at their Bases, are often tinged with its glowing red. The Flowers are moderately large, and of a very delicate colour, mixt of the high crimson of the Stalk, and a right violet blue; sometimes they are pale, and on some Plants white: they blow in August. The lowest Scales of the Cup are in this as in the preceding remarkably leafy, and they degenerate into absolute Leaves of a lanced form; which, as they grow lower down the Footstalks become longer, and gradually assume the perfect form of the Leaves.

17. FLAXEY ASTER.

Plate 53. Fig. 17.

Character of the Species.

After linifolius.

The Leaves are linear and soft; the Stalk spreads into a vast branchy even head.

Fig. 17. *a b*.

THIS is a low and simple, but yet far from an inelegant Species. It is native of North-America; and flowers early in September: the Plant is two feet high: the Stalk is firm, brown at the bottom, but green toward the top. It has scarce any branches near the ground; but toward the top sends out innumerable ascendant Boughs, which all terminating nearly at the same height, make a vast bushy head. The Flowers are blue, with a tinge of crimson.

18. SHORT-RAY'D ASTER.

Plate 53. Fig. 18.

Character of the Species.

After miser.

The Flower is oval; for the Disk rises high, and the Rays do not equal it in length.

Fig. 18. *a*.

THIS is a very poor Aster, a low Plant, with the smallest and least handsome Flowers of all the Genus. It is seldom two feet high: the Leaves are dusky, oblong, narrow, and hang drooping. The Stalk is altogether green. The Flowers are white, with a yellow Disk. The Rays are few, short and poor. It blows in September.

19. BUSHY

19. BUSHY ASTER.

Plate 54. Fig. 19.

Character of the Species.

After dumosus.

The Leaves are linear and undivided. The Stalk branches toward the head, into a multitude of very slender striated twigs. The Disk of the Flower is small.

Fig. 19. *a b c.*

THIS is a native of Virginia, a well looking Plant, but not conspicuous for its Flowers. It is a Perennial, four feet high, with fine fresh green Leaves, and innumerable Branches spreading into a good form, and well covered; but the Flowers, which appear late, are only moderately large, and are white. The main Stem is brown; the Branches toward the top are green, but ridged with brown; the Cups of the Flowers have a degradation of Scales, which run from them all the way down the twigs which carry them; they are linear toward the tops, but by degrees they get some breadth, as they descend, till where they meet the absolute Leaves of the Stalks, they have their proper lanced form.

20. HEART-LEAV'D ASTER.

Plate 54. Fig. 20.

Character of the Species.

After Cordifolius.

The Leaves are Heart-shaped, and placed, on Footstalks: they are serrated and smooth. The Stalk divides into a bushy head.

Fig. 20. *a b.*

THIS, though a native of North-America is common also to Tartary and the mountains of Tibet, whence we have our Rhubarb. It is a Perennial, and flowers with the rest late in Autumn. The Plant is seldom more than two feet high: the Stalk is weak and green: the Leaves are of a strong and very fine green. The Flowers are very numerous, and of a delicate blue, with some cast of Crimson.

21. PYRENÆAN ASTER.

Plate 54. Fig. 21.

Character of the Species.

After Italicus.

The Leaves are oval and obtuse; the Scales of the Cup are small.

Fig. 21. *a b.*

THIS is a Perennial, an European, native of the hills in Italy, and throughout that part of Europe. It flowers earlier than the American or Indian kind. Often in the very beginning of August. The Plant is two feet high: the Leaves are of a greyish green: the Flowers stand at the tops of the Stalks in a kind of flat Tuft, and are large, and of a very delicate blue.

ASTERS.

A S T E R S.

THE SECOND ARRANGEMENT.

Those with the Leaves and Cups perfectly separate and distinct.

22. WOOLLY ASTER.

Plate 55. Fig. 22.

Character of the Species.

After Alpinus.

The Leaves are lanced, and covered with a harsh but woolly matter. One Flower only terminates the Stalk.

Fig. 22. *a b*.

THIS is a native of the European hills; those of Germany, the mountains of Switzerland, and the Alps and Pyreneans, toward their bottoms, afford it in abundance. It is a Perennial, and flowers in August. The Stalk is weak and hairy: its colour is a greyish green, and it rises naturally without Branches: the Leaves also are greyish, woolly, and yet harsh to the touch. One Flower crowns the summit of the Stalk: and this is very large and of a celestial blue. The radical Leaves are broad and short; those on the Stalk are longer.

23. DOTTED ASTER.

Plate 55. Fig. 23.

Character of the Species.

After fruticosus.

The Leaves are spotted, narrow, and placed in seeming clusters.

Fig. 23. *a b*.

THIS is a singular, rather than an elegant Plant: it is a native of the Cape of Good-Hope; and hangs there from the clefts of rocks in a wild dangling manner in vast profusion. It is a Perennial, and its Stalk is so hard toward the Base, that it approaches the nature of a Shrub. This part of the Stem is brown; the tender part is green: the Leaves are of a dusky green, spotted very delicately with a strong brown. They rise in pairs; but the opening Buds in their bosom give them a clustery appearance on the Plant. The Flowers are white: they blow in July.

24. SIBERIAN ASTER.

Plate 55. Fig. 24.

Character of the Species.

After Sibericus.

The Leaves have high Ribs, and are notched toward the ends. The Footstalks of the Flowers are woolly.

Fig. 24. *a b*.

THIS is a native of Siberia, a Perennial; a singular, and not unhandsome Plant. The Stalk is brown, rough toward the bottom, and striated on the upper part. The Leaves are of a deep green, and are somewhat rough and uneven on the surface. The Flowers are large and of a pale blue: they stand singly on their naked Footstalks, and make a kind of Umbel at the summit of the Plant. They blow in September.

25. SEA-SIDE ASTER.

Plate 56. Fig. 25.

Character of the Species.

After Tripolium dictus.

The Leaves are fleshy, lanced, undivided, and smooth; the Branches rise irregularly, and the Flowers are clustered at the ends.

Fig. 25. a b.

THIS is a Perennial, an European Aster; singular in its Place of growth, on ground wet with salt water; and is the only Species we have wild in our country. Tho' it requires land moistened with salt water, yet a very small portion of the salt will answer. Wherever rivers are salt at the high tides, this Plant will grow upon their banks: we see it by the Thames.

THE Plant is four feet high: the Stalk is often red: the Leaves are of a pale green: the Flowers are of a delicate blue, with some slight tinct of crimson.

26. ATTIC ASTER.

Plate 56. Fig. 26.

Character of the Species.

After amellus dictus.

The Leaves are rough, three-rib'd, and half embrace the Stalk. The Cups are remarkably loose in their texture.

Fig. 26. a b.

THIS is a perennial European Aster, frequent on the barren hills of the southern part of the Continent. It flowers in August. The Stalk is firm, erect, two feet high, and often tinged with brown, or with a dusky red: the Leaves are of a faint green: they have three strong Ribs, and their surface is rough. The Flowers are large and blue: they grow in bunches, or roundish clusters at the top of the Stalk and Branches.

27. WIDE-BRANCHED ASTER.

Plate 56. Fig. 27.

Character of the Species.

After divaricatus.

The Stalk divides into remote spreading Branches. The Leaves are oval, and serrated.

Fig. 27. a b.

THIS is an American, a spreading Plant; but of less beauty than many of the others. It is a Perennial, and flowers in September with the rest. The Stalk is hard but weak: it grows to two feet and a half high. The Leaves are of a deep green; and they are smooth and glossy on the surface. The top Branches are green; but the lower part of the Stalk is brown; and the Flowers are large but white, with a yellow Disk; as is the case with almost all the blue or crimson ones.

28. CRIM-

28. CRIMSON-STALKED ASTER.

Plate 57. Fig. 28.

Character of the Species.

After puniceus.

The Leaves are lanced, rugged, serrated, and half embrace the Stalk : the Footstalks of the Flowers rise alternate, and seldom have more than one Flower.

Fig. 28. a b.

THIS is a Perennial also, native of North-America ; a very fine and very singular Plant ; whose Stalks have great elegance ; and its appearance is therefore beautiful before it flowers. The Plant is five feet high : the Leaves are rugged, but of a fresh and strong green ; and the Stalks are throughout of this lively crimson ; which also stains often the lower Leaves, and even the Bases of the upper ones. The Flowers are moderately large and blue, with some light tinge of crimson.

29. ANNUAL LANCED ASTER.

Plate 57. Fig. 29.

Character of the Species.

After annuus.

The Leaves are lanced and serrated ; the Stalk is spread out into Branches.

Fig. 29. a b.

THIS is a North-American, native of Canada ; and is not an unhandsome Plant. It flowers in August, and differs from all the rest of the Asters of that country, in that it is an Annual ; the Root perishing before Winter. The Stalk is tolerably firm, and a yard high. The Leaves are of a pale, but fresh green : the bottom of the Stem is often brown or red, and the upper part green. The Flowers are white, with a yellow Disk.

30. SPRING ASTER.

Plate 57. Fig. 30.

Character of the Species.

After Vernus.

There are scarce any Leaves upon the Stalk, and the few there are, are filmly and imperfect.

Fig. 30. a b.

THIS is a Perennial, native of Virginia, a very singular Plant ; differing in aspect, and in its time of flowering, from all others ; and yet by every character a perfect Aster. The Leaves from the Root are of a delicate, though not strong green. The Stalks are hairy, weak, and divided into a few Branches : the filmly Leaves on them are very pale : the Flowers are white, but have a yellow Disk. It blows early in May, and in mild seasons sooner.

G E N U S IX.

C R O W N S E E D.

A R C T O T I S.

Character of the Species.

The Cup has three Rows of dissimilar Scales; the lowest Range are awly, and stand loose; the second are oval; and the upper ones oblong and hollowed with round shining Points.

Plate 58. *aaa*.

1. PINNATIFID CROWNSEED.

Plate 58. Fig. 1.

Character of the Species.

Arctotis trifida.

The Leaves are deeply pinnatifid: the Flower has about twenty Rays, which are deep cut into threes at the end.

Fig. 1. *ab*.

THIS is an Annual, native of the Cape of Good Hope; a very fine and elegant Plant. The Stalk is weak though thick: it is brown on the sunny side, and green on the other. The Leaves are hairy, and of a faint but somewhat dusky green on the upper side, and pale underneath. The Flower is large, and elegant: its colour yellow: the Rays are cut deep into threes. It flowers in June.

2. EGG-LEAV'D CROWNSEED.

Plate 58. Fig. 2.

Character of the Species.

Arctotis Calendulacea.

The Leaves are egg-shaped and indented, and have very long Footstalks: the Rays are about twelve, and are scarce at all divided.

Fig. 2. *ab*.

THIS also is an Annual, native of Ethiopia, and flowers in July and August. The Stalk is pale: the Leaves are of a strong, but somewhat bluish green, and paler on the under than on the upper side. The Flower is of a pale Lemon colour, somewhat deeper on the outside than within: very large and handsome.

3. LONG-JAGGED CROWNSEED.

Plate 58. Fig. 3.

Character of the Species.

Arctotis aspera.

The Leaves are cut in the pinnatifid manner, but somewhat irregular; with many long Segments, which are jagged again in the same way.

Fig. 3. *ab*.

THIS is a Perennial, native of the Ethiopian sands, and flowers from June to October; the Leaves are of a greyish green, and rough. The Flowers are crimson on the outside, and of a Lemon colour within.

4. LINEAR CROWNSEED.

Plate 58. Fig. 4.

Character of the Species.

Arctotis angustifolia.

The Leaves are linear and lightly dented.

Fig. 4. *ab*.

THIS is a Perennial, native of the Cape of Good Hope, and flowers in September. The Leaves are of a deep green, and harsh to the touch. The Flowers are straw-coloured on the inside, and Violet-coloured on the outside. The Stalk is weak.

G E N U S X.

F L E A B A N E.

C O N Y Z A.

Character of the Genus.

The Cup is rounded: the Scales of it are sharp-pointed, and spread out at their Points.

Plate 59. *a a b.*

1. R E F L E X F L E A B A N E.

Plate 59. Fig. 1.

Character of the Species.

Conyza linifolia.

The Leaves are lanced but narrow; the Rays of the Flower bend back.

Fig. 1. *a b.*

THIS is a Perennial, native of North-America, and flowers in September. The Stalk is brown; the Leaves are of a dusky green, rough and rugged on the surface, and hard to the touch. The flowers are very numerous, and small: they are white, with a yellow Disk, and the Rays turn naturally back, in the manner of many of the Asters when they are fading.

2. B R O A D - L E A V ' D F L E A B A N E.

Plate 59. Fig. 2.

Character of the Species.

Conyza asteroides.

The Leaves are lanced, but broad and serrated: the Rays stand strait.

Fig. 2. *a b.*

THIS is a Perennial also, native of the same part of the World, with the preceding, and most plentiful of all, in Canada. It flowers at the end of August. The Stalk is firm, erect, rugged, and brown. The Leaves are of a brownish green, and have a rough, uneven aspect: the Flowers grow at the tops of the Branches, and are large and white: their Rays are short and narrow.

3. A M P L E X I C A U L F L E A B A N E.

Plate 59. Fig. 3.

Character of the Species.

Conyza bifrons.

The Leaves are egg'd: but oblong, and they embrace the Stalk at the Base.

Fig. 3. *a.*

THIS is a native of the European mountains; the Pyrenæan and Swiss hills; delighting in the thickets with moist ground at their bottoms. The leaves are oblong, broad, and approaching to the egg'd shape: they are of a pale yellowish green, and are rugged on the surface. The Flowers are smaller and less numerous than in the preceding kinds. It is a Perennial, and blows in July.

It is said there is a naked kind of this in Canada.

4. W O O L Y F L E A B A N E.

Plate 59. Fig. 4.

Character of the Species.

Conyza bifoliata.

The Leaves are woolly, oval, and dented; and two grow upon each Flower-stalk.

Fig. 4. *a a.*

THIS is a Perennial, native of China and the East-Indies; and flowers in June. The Stalk is erect, rugged, and stained with crimson: the Leaves are white and woolly: the Flowers are numerous, small, and whitish.

5. WREATHED FLEABANE.

Plate 60. Fig. 5.

Character of the Species

Conyza tortuosa.

The Stalk is woody and wreathed: the Flowers are placed in drooping clusters.

Fig. 5. a b.

THIS is native of Vera-Cruz, and of the island of Madagascar; a perennial Plant, with a firm woody Stalk, though not deserving the name of a Shrub. It flowers in June; the Bark is of a dusky brown: the Leaves are of a fresh and lively green; the Flowers are small; but they hang from the sides of the Branches in considerable bunches; and, partly from their quantity, partly from their pendent form, they make a pretty appearance.

6. CLUSTERY FLEABANE.

Plate 60. Fig. 6.

Character of the Species.

Conyza candida.

The Leaves stand singly: they are oval and woolly. The Flowers are placed in clusters.

Fig. 6. a b.

THIS is a Perennial, native of Crete, and other of the neighbouring islands. It flowers in June. The Stalks are solid, woody, and of a rugged aspect: they spread every way from the Root; but are seldom more than a foot long. The Flowers are small, and of a faint yellow: but the Leaves are very beautifully silvery.

7. GREY FLEABANE.

Plate 60. Fig. 7.

Character of the Species.

Conyza cinerea.

The Leaves are oblong: the Flowers stand in large divided clusters.

Fig. 7. a b.

THIS is an Annual, native of the East-Indies, and flowers in July. The Leaves are oblong, of a fine green, and sometimes lightly indented. The Stalks are of a yellowish green. The Flowers are very numerous, but not large: they stand in divided clusters at the tops of the branches.

8. THREE-FLOWER'D FLEABANE.

Plate 60. Fig. 8.

Character of the Species.

Conyza Chinenfis.

The Leaves are egged, but somewhat swelling in the middle. The Flowers stand by threes.

Fig. 8. a b.

THIS is an Annual, native of China, and flowers in July. The Stalk is stained with red: the Leaves are of a fresh fine green, and the Flowers are of a dusky yellow, not very large or elegant.

9. SCABROUS FLEABANE.

Plate 60. Fig. 9.

Character of the Species.

Conyza hirsuta.

The Leaves are oval, undivided, rugged on the upper side, and hairy below.

Fig. 9. a b.

THIS is a native of China, a Biennial, flowering in August. The Stalks hairy and brown; the Leaves are of a dusky brownish green on the upper side, and white underneath. The Flowers are yellow.

* * THE two last Species, and most of the others, have sometimes the Flower naked; and will be repeated under that form in the succeeding Class.

THERE is also an absolute Shrub, with the *Conyza* character, which will be given among the Shrubs and Trees.

GENUS

G E N U S XI.
E T E R N A L F L O W E R.
X E R A N T H E M U M.

Character of the Genus.

The inner range of Scales are long, filmy, and shine, resembling rays. All are of a lanced form. The rays are very tubular at their Base.

Plate 61. Fig. 1. a. b.

1. SPREAD-LEAV'D ETERNAL FLOWER.

Plate 61. Fig. 1.

AUSTRIAN PTARMACA.

Xeranthemum annuum.

Character of the Species.

The Leaves are lanced, and they spread out upon the Stalks.

Fig. 1. a. b.

THIS is an Annual, native of many parts of Europe; and is so beautiful in itself, and capable of being so much improved by culture, that it was early received into our gardens; and has continued always in estimation. It is two feet high, and spreads into several branches: the Leaves are whitish, and the Stalks are hoary: the Flowers are of a fine purple, and very beautiful. They will preserve their lustre a great while, if kept dry: and have thence been called Eternal Flowers. Originally the Plant was known among our Gardeners by the name of Austrian Ptarmaca. The Flower grows larger and double by culture.

2. PINNATIFID ETERNAL FLOWER.

Plate 61. Fig. 2.

Xeranthemum crucifolium.

Character of the Species.
The Leaves are long, and deeply cut into Segments in the pinnatifid manner.

Fig. 2. a.

THIS is a native of Siberia, a perennial and very beautiful Plant. The Stalks are weak, and lean a little on the ground: the Leaves are of a pale green: the Flowers are pale and small: the Stalk has often some tinge of crimson, where it leans upon the Earth. It flowers in August.

3. FEW-FLOW'RD ETERNAL FLOWER.

Plate 61. Fig. 3.

Xeranthemum vestitum.

Character of the Species.

The Leaves are linear: the Footstalks of the Flowers are covered with many small Leaves.

Fig. 3. a. b.

THIS is a Perennial, native of the Cape of Good Hope; a very beautiful Plant: the Stem is woody, and its Bark is rough: the young Shoots are whitish: the Leaves are white and downy, or even woolly: the Flower is very large and snow white, and has a gloss like Pearl, most singularly beautiful.

4. SUPERB ETERNAL FLOWER.

Plate 61. Fig. 4.

Xeranthemum speciosissimum.

Character of the Species.

The Leaves are lanced: the Footstalks of the Flowers are almost naked.

Fig. 4. a. b.

THIS also is a native of the Cape, a Perennial, with a woody Stem, but no true Shrub. The Shoots and Leaves are covered with a white cottony matter. The Flowers are very large, and with their nature pearly white, have a tinge of red.

5. PROLIFEROUS ETERNAL FLOWER.

Plate 61. Fig. 5.

Xeranthemum proliferum.

Character of the Species.

The young Shoots rise in numbers from one point: the Leaves stand close.

Fig. 5. a. b.

THIS also is an Æthiopian, a beautiful Plant, with a woody Stem, and innumerable Branches. The Leaves are of a greyish green, and the Flowers are white.

6. DECUM-

6. DECUMBENT ETERNAL FLOWER.

Plate 62. Fig. 6.

Character of the Species.

Xeranthemum retortum.

The Stem is hard but decumbent : the Leaves are downy, and turn back.

Fig. 6. *a b.*

THIS is another of the woody Cape Plants, which some have called Shrubs, tho' without just cause. The seasons there are so mild, that the Stalks remain from year to year ; and by remaining harden : a little severe weather would kill them, and the Root only would remain ; it would then shoot again in spring, and the Stalks, not having more than one Summer's duration, would be firm but not woody. This degree of hardness and permanency which is owing more to the climate than the nature of the Plant, cannot make it a proper Shrub. It is common among the Cape Plants ; and being once explained, will be always understood hereafter.

THE Stalks of this Species are a yard long ; they lie upon the ground. The Leaves are small and silvery ; the Flowers are white ; they have the same gloss as the others of this kind, and are very beautiful.

7. EDGED-LEAVED ETERNAL FLOWER.

Plate 62. Fig. 7.

Character of the Species.

Xeranthemum ciliatum.

The Stalk is weak but woody : the Leaves are edged with stiff short hairs.

Fig. 7. *a b.*

THIS is another of the woody-stalked *Xeranthemums* of the Cape ; and, by a very singular accident has been confounded even under the sanction of great names with the Reflex Aster. The stalks are brown and weak : the Leaves are small and bent back, and they have a rough brown edge. The Flowers are large and white.

8. PRICKLY ETERNAL FLOWER.

Plate 62. Fig. 8.

Character of the Species.

Xeranthemum spinosum.

The Scales of the Cup terminate in hard sharp thorns.

Fig. 8. *a.*

THIS is a Perennial, native of Ethiopia ; a very beautiful Plant. The Stalk is whitish ; the Leaves also are of a whitish green. The Flower is of a very beautiful crimson : it is more compact than in the others ; and the Cup is prickly.

9. SCALY ETERNAL FLOWER.

Plate 62. Fig. 9.

Character of the Species.

Xeranthemum Sesamoides.

The Leaves are scaly, and stick close to the Branches.

Fig. 9. *a b.*

THIS also is a native of the Cape, with tough woody Twigs : a pretty looking Plant, and flowers in August. The Shoots are whitish and downy ; the Leaves are of a whitish colour, often tending to brown ; and the Flowers are pearly white.

10. HOARY ETERNAL FLOWER.

Plate 62. Fig. 10.

Character of the Species.

Xeranthemum paniculatum.

The Leaves are linear, but sharp-pointed and hoary. The Flowers stand in divided Clusters.

THIS also is a woody Plant, native of the Cape ; and flowers in August. The Branches are whitish ; the Leaves are grey and hoary ; and the Flowers snow white.

G E N U S

G E N U S XII.

S C A L E W O R T.

L E P I A.

Character of the Genus.

The Cup is cylindric: its Scales are oval, broad, hollowed, and swell outward: each is terminated at its top by a broad, obtuse, rounded, shining rim, of a dry thin substance.

Plate 63. Fig. *abb*.

O F this Genus we yet know only one Species.

I. G O L D E N S C A L E W O R T.

Plate 63.

Character of the Species.

The Leaves are placed in pairs, and have no Footstalks.

Fig. 63. *ab*.

THIS is an Annual, native of China, and flowers in July and August. It is very new in Europe, not being seen here till the year 1758, when it was raised from Seeds, I received from a Correspondent in China. The Plant is two feet and a half high: the Stalk is round, firm, and brown: the Branches are numerous and ascendent: the Leaves are of a strong and but coarse green. The Flowers stand singly at the tops of all the Branches, and they are large and yellow. The first Flower which blows, is placed at the head of the proper Stalk, and is the largest and most perfect: its rays are remarkably broad, and their colour is a delicate yellow. Some of the Branches soon overgrow this in height, and consequently place their Flowers above it; but they are always smaller, and less perfect.

FROM what I have seen in some imperfect trials, I think this Plant may have its Flower doubled, enlarged, and quilled by culture; and in that state will have the aspect of the Tagetes, but with a better cup, and more breadth in the Rays; and consequently may be made a finer Flower.

I named it Lepia, from the peculiar form and construction of the Scales of the Cup; which resemble the little Flakes of Talc.

G E N U S XIII.

F E V E R - F E W .

M A T R I C A R I A .

Character of the Genus.

The Cup is hemispheric, and is composed altogether of linear equal Scales.

Plate 61. Fig. a. b.

1. R A M O S E F E V E R - F E W .

Plate 64. Fig. 1.

Character of the Species.

COMMON FEVER-FEW.
Matricaria Parthenium dicta.

The Footstalks of the Flowers are branched; the Leaves are composed of many oval jagged parts.

Fig. 2. a. b.

THIS is a Perennial, native of our own country, and common in waste places; flowering from July to November. It is two feet high, and very much branched: the Leaves are of a pale and somewhat yellowish green: the Flowers are white, with a yellow Disk. In many places we see them naked; and in gardens double.

1. F L E S H Y - L E A V ' D F E V E R - F E W .

Plate 64. Fig. 2.

Character of the Species.

SEA CHAMÆMILE.
Matricaria maritima.

The Leaves are fleshy, and twice winged; and stand alternate: the Segments are convex on the upper side, and hollow below.

Fig. 2. a. b.

THIS also is an English perennial Herb, native of our sea coasts; a low Plant, flowering in August. The Stalks are red toward the ground: the Leaves are of a dark green: the Flowers are white, with a yellow Disk.

3. F I N E - L E A V ' D F E V E R - F E W .

Plate 64. Fig. 3.

Character of the Species.

Matricaria chamæmilla dicta.

The Leaves are recompounded with thready Segments: the Rays of the Flower spread.

Fig. 2. a. b.

THIS also is a native of England, an Annual, common in corn-fields and on banks, flowering from July to November. The Authors of earlier time called both this and the former, Species of Chamæmille; but the Cup shews them to be of another Genus.

THIS is a foot and a half high: the Stalk is pale: the Leaves are of a dark green: the Flowers are large and white, with a rounded yellow Disk.

4. S I L V E R Y F E V E R - F E W .

Plate 64. Fig. 4.

Character of the Species.

Matricaria argentea.

The Leaves are bipinnate, and stand in Pairs: the Flowers stand singly on their Footstalks.

THIS also is a native of the East, a very pretty Plant. The Stalk is grey. The Leaves are very beautifully divided, and of a silvery white; and the Flowers are white, with a yellow Disk.

5. F R A G R A N T F E V E R - F E W .

Plate 60. Fig. 5.

Character of the Species.

Matricaria recutita.

The Leaves are finely divided: the Rays of the Flower hang drooping.

Fig. 5. a. b.

THIS is an Annual, native of the southern parts of Europe; and flowers in August. The Stalk is a foot high: the Leaves are of a pale green: the Flowers are white; but their high Disk is of a fine yellow.

G E N U S

GENUS XIV.

YARROW.

ACHILLÆA.

Character of the Genus.

The Cup is oval, and drawn in at the top: its Scales are oval and acute.

Plate 65. Fig. a b.

1. TWICE-WING'D YARROW.

Plate 65. Fig. 1.

Character of the Species.

Achillæa bipinnata.

The Leaves are twice divided, in the winged manner; and the Leaflets are oval.

Fig. 1. a b.

THIS is a Perennial, native of the East; but will bear the open air in a dry soil with us. The Plant is ten inches high: the Stalk is downy and white: the Leaves are also white, and the Flowers stand so close, that they resemble only a spot of that yellow Moss we see on walls in Winter. The Leaflets are often united so as to form only Segments; and the Leaves are so downy, that their outline is not seen distinctly. LINNÆUS has placed this among his white-flower'd Achillæas; but it is only some oversight. The Flowers are yellow. It blows in August.

2. HAIRY YELLOW YARROW.

Plate 65. Fig. 2.

YELLOW YARROW.

Character of the Species.

Achillæa tormentosa.

The Leaves are winged: the Leaflets are cut into three parts at the top, and the middle one of these is longest.

Fig. 8. a b.

THIS is a Perennial, native of France and Germany, and has been long common in our Gardens; where it flowers all the latter part of Summer. The Plant is a foot high: the Leaves are covered with flight hairs: the Flowers are large and yellow.

3. PASTURE YARROW.

Plate 65. Fig. 3.

COMMON YARROW.

Character of the Species.

Achillæa millefolium dicta.

The Leaves are bipinnate; and the Leaflets stand close, and are not hairy.

Fig. 3. a b.

THIS is a Perennial, the common Yarrow of our Pastures, flowering from June to November. The Plant is two feet high: the Leaves are dark green, and the Flowers are naturally white; but they have often a very delicate blush of crimson.

4. PINNATIFID YARROW.

Plate 65. Fig. 5.

Character of the Species.

Achillæa clavennæ.

The Leaves are woolly, and are cut deep into broad, irregular, obtuse Segments.

Fig. 4. a b.

THIS is a Perennial, native of Germany; and flowers in July. The Plant is ten inches high: its Leaves are silvery, white, and so downy, that their outline is but indistinctly seen. The Flowers are large and white.

5. OPEN-LEAV'D YARROW.

Plate 65. Fig. 5.

Character of the Species.

Achillæa nobilis.

The segments of the Leaves spread open.

THIS is a Perennial, native of Switzerland, Germany, and elsewhere in Europe. It flowers in July. The Plant is a yard high, and remarkably erect. The Leaves are of a pale green, their Segments stand wide asunder. The Flowers are moderately large and white.

6. CURLY

6. CURLY YARROW.

Plate 66. Fig. 6.

Character of the Species.

Achillæa fantolina.

The Leaves are bristly and dented; and the points of the divisions curl back.

Fig. 6. *a b.*

THIS is a Perennial, native of the Greek islands; and flowers in August. The Plant is two feet high: the Leaves are of a pale green; and the Flowers are large, and of a strong and good yellow. There is a slight downy matter spread over the whole Plant, Leaves, Stalks, and Cups, but mostly on the latter.

7. LANCED YARROW.

Plate 66. Fig. 7.

Character of the Species.

MAUDLIN.

Achillæa ageratum dicta.

The Leaves are single, lanced, ferrated, and obtuse.

Fig. 7. *a.*

THIS is a Perennial, native of Hungary, and other parts of Europe, and flowers in August. It is two feet and a half high: the Leaves are of a yellowish green: the Stalks are of the same hue, but paler, and the Flowers are yellow: they are moderately large and lasting.

8. SICKLED YARROW.

Plate 66. Fig. 8.

Character of the Species.

Achillæa falcata.

The Leaves are linear, obtuse, and doubly dented; and they are naturally hooked.

Fig. 8. *a.*

THIS is native of the islands in the Archipelago; a singular and elegant perennial Plant, flowering in July and August. The Stalk is pale: the Leaves are but of a dead green. The Flowers are of a very faint yellow.

9. GOLDEN YARROW.

Plate 66. Fig. 9.

Character of the Species.

Achillæa pubescens.

The Leaves are winged; the Leaflets are lanced and dented, and woolly underneath.

Fig. 9. *a b.*

THIS also is a Perennial, native of the East; and flowers in July. The Plant is two feet high: the Stalk is reddish usually at the Base: the Leaves are of a pale green on the upper side, and quite white and woolly on the under. The Flowers are very conspicuous: their colour is a very perfect and delicate gold yellow. VAILLANT very fitly names it Flore Aureo.

10. RECOMPOUNDED YARROW

Plate 66. Fig. 10.

Character of the Species

Achillæa abrotani folia.

The Leaves are divided into innumerable slender Segments, which stand distant.

Fig. 10. *a.*

THIS is a native of the East, a Perennial; flowering in Autumn, a very stately and beautiful Plant. The Stalk is upright, firm, and four feet high. The Leaves are of a fine and delicate, though not strong green. The Flowers are yellow.

11. I R R E-

11. IRREGULAR LEAV'D YARROW.

Plate 67. Fig. 11.

Character of the Species.

Achillaea macrophylla.

The Leaves are winged: the Side Leaflets are narrow and distinct; those toward the end run together, and form one large irregular Lobe

Fig. 11. a b.

THIS is a Perennial, native of the Pyrenæan and Swiss mountains. It flowers in August. The Stalk is upright, round, pale, and three feet high. The Leaves are four or five inches long; of a fresh but not deep green; and the Flowers are white, and placed in broad clusters.

12. GLOSSY YARROW.

Plate 67. Fig. 12.

Character of the Species.

Achillaea impatiens.

The Leaves are winged: the Leaflets stand distant, and are glossy.

Fig. 12. a b.

THIS is a Perennial, native of Siberia, and flowers in September. The Stalk is two feet high, round, firm, pale, smooth, and hollow: the Leaves are of a deep and shining green: the Flowers are white.

13. SHARP-SAW'D YARROW.

Plate 67. Fig. 13.

Character of the Species.

*SNEEZEWORT.
Achillaea Ptarmica dicta.*

The Leaves are narrow, lanced, sharp pointed, and very sharply ferrated.

Fig. 13. a.

THIS is a Perennial, native of many parts of Europe; and flowers from June to October. It is two foot and a half high. The Stalk is round, smooth, firm, and pale. The Leaves are of a dead green, rigid and hard to the touch. The Flowers are large and white; and they crown the Stalk in an open cluster: Culture easily renders them double.

14. DOUBLE-JAGG'D YARROW.

Plate 67. Fig. 14.

Character of the Species.

Achillaea Alpina.

The Leaves are lanced, and deeply sawed; and the Teeth are sawed again.

Fig. 14. a.

THIS is a native of the mountains of Siberia, a rough perennial Plant, flowering in August. The Stalk is pale, and somewhat weak: the Leaves are of a fine green, and the Flowers are white.

15. PECTINATE YARROW.

Plate 67. Fig. 15.

Character of the Species.

Achillaea atrata.

The Leaves are winged; the Leaflets are oblong, and cut like the teeth of a comb at their Edges.

Fig. 15. a.

THIS is a Perennial, native of the Swiss mountains, and other parts of Europe. The Plant is two feet and a half high: the Stalk is red towards the ground: the Leaves are of a pale green, and somewhat hoary: and the Flowers are white; but there is a blackness about the Cups.

16. DWARF YARROW.

Plate 68. Fig. 16.

Character of the Species.

Achillæa nana.

The Leaves are winged; the Leaflets are indented, and covered with a cottony matter. The Flowers stand clustered, and their Cups are small.

Fig. 16. a b.

THIS is a Perennial, native of the Swiss and Austrian mountains, a small and humble Plant, flowering in July. The Stalks are weak, woolly, and seldom above six inches long. The Leaves are of a greyish colour, and the Tuft of Flowers has a tinge of brown: this is from the Cups; for the Flowers themselves are white; but they are small, and stand confused in their thick cluster. The Cups have always an evident tinge of a pale brown.

17. WOOLLY YARROW.

Plate 68. Fig. 17.

Character of the Species.

Achillæa Cretica.

The Leaves are winged; the Leaflets are roundish, and imbricated backwards.

THIS is a native of the islands of the Archipelago, a perennial, hardy Plant; and flowers in August. The Stalk is covered with a white woolly matter: the Leaves are of a pale green, and have a very singular aspect, from the imbricated disposition of the Leaflets. The Flowers are white, not large, but of a bright and pleasing aspect.

18. CRESTED YARROW.

Plate 68. Fig. 18.

Character of the Species.

Achillæa Ægyptiaca.

The Leaves are pinnated, and the Leaflets are jagged and crested.

Fig. 18. a b.

THIS is a native of Egypt, a beautiful little Plant. The Stalk is low and weak, edged, and of a greyish green colour. The Leaves are very beautiful; they are of a whitish hue; but their crested edge is brown. The Flowers are small, and of a pale yellow. They blow in September.

19. TRIFID YARROW.

Plate 68. Fig. 19.

Character of the Species

Achillæa inodora.

The Leaves are jagged, deep at the edge, and cut into three at the ends.

Fig. 19. a b.

THIS is a Perennial, native of Africa, and flowers in August. The Stalk is of a faint green: the Leaves are very beautifully cut, and their Edge, as in the last Species, is usually of a colour different from the rest, a pale brown, the body of the Leaf being a pale green. The Flowers grow in full clusters, and are of a very delicate, though not strong yellow.

G E N U S

G E N U S XV.

G O L D E N R O D.

S O L I D A G O.

Character of the Genus.

The Cup is cylindric : its Scales are narrow, and sharp pointed : they stand erect ; only the Points of the upper Series turn a little inwards.

Plate 69. *a b*.

1. FLESHY-LEAV'D GOLDEN ROD.

Plate 69. Fig. 1.

Character of the Species.

Solidago semper virens.

The Leaves are lanced, and somewhat fleshy : their Surface is smooth, but their Edge is rugged.

Fig. 1. *a b*.

THIS is a Perennial, native of New-England ; a very stately and robust Plant, six feet high, or more ; flowering in October. The Stalk is naturally crimson : the Leaves are of a fine fresh green, but a little brownish, and rugged at the edges : and they defy our frosts, and keep in health and freshness all the Winter. The Flowers are of a beautiful yellow, and crown the tops of the Plants in large spreading moderately open clusters.

2. ROUGH-LEAV'D GOLDEN ROD.

Plate 69. Fig. 2.

Character of the Species.

Solidago canadensis.

The Leaves are narrow : they have three strong Ribs ; and they are rough on the surface, and slightly sawed at the Edge. The Branches of Flowers turn back ; but the Flowers stand upwards.

Fig. 2. *a b*.

THIS is a Perennial, native of North-America, and flowers toward the end of September. The Stalk is pale green, and four feet and a half high. The Leaves are of a faint and but obscure green : The Flowers form a vast spreading and very elegant Panicle, and are of a good yellow.

3. EVEN-LEAV'D GOLDEN ROD.

Plate 69. Fig. 3.

Character of the Species.

Solidago altissima.

The Leaves have no distinguishable Ribs : the Flowers stand slanting on the flowering Branches.

Fig. 2. *a b*.

THIS also is a Perennial, native of North-America, and flowers at the very latter end of Autumn. The Stalk is rugged, upright, and near four feet high. The Leaves are uncertainly and irregularly dented ; but their Surface is even, and they have no apparent Ribs. The Flowers stand on the top in very large beautiful spreading clusters

4. HARSH

4. HARSH GOLDEN ROD.

Plate 70. Fig. 4.

Character of the Species.

Solidago rigida.

The Leaves are oval, harsh, and waved: the Flower-stalks from the bosoms of the Leaves rise as high as those which terminate the Stalk; and the Flowers crown it in a broad even Bunch.

Fig. 4. a b.

THIS is a native of Pennsylvania, and New-England, a Plant very distinct from the rest in its general aspect, and in the disposition of its Flowers. The Flowers themselves are also larger, than in most of the *Solidagos*; the Rays longer, and the colour a better yellow. It is about a foot and a half high: the Stalk is pale, thick, and upright: the Leaves are of a dusky green, and are remarkably hard and harsh to the touch. It flowers in August.

5. DELICATE GOLDEN ROD.

Plate 70. Fig. 5.

Character of the Species.

Solidago Mexicana.

The Stalk rises oblique: the Leaves are lanced and undivided: The Foot-stalks of the Flowers are upright and leafy.

Fig. 5. a b.

THIS is a Perennial, native of South-America; but bears the free air very well with us, and is the most delicate by far of all the Golden Rods. The Plant is three feet high: the Stalk is naturally tinged with crimson: the Leaves are smooth, and of a pale green: the Flowers spread over the expanded top of the Stem in a vast open cluster: they are in their shape as well as colour delicate and tender: they are slenderer than in others; they stand more distant, and their colour is a fine pale, golden yellow. It flowers in the beginning of September.

6. CLUSTERY GOLDEN ROD.

Plate 70. Fig. 6.

Character of the Species.

Solidago lateriflora.

The Leaves are lanced, and have only one or two indentings. The Flowers stand at the tops of the Branches in compact close clusters. The Branches rise from the lower part of the Stalk.

Fig. 6. a b c.

THIS is a singular species differing from the other kinds in its manner of growth. It is four feet high. The Stalk rises single to its summit, only a little below the middle of its height there grow up several ascendant Branches like the main Stem, and each of them terminated by the same sort of cluster of Flowers. It blows in September.

7. GLANEOUS

7. GLAUCOUS GOLDEN ROD.

Plate 71. Fig. 7.

Character of the Species.

Solidago cæsia.

The Leaves are oblong, lanced, and sharply ferrated: the Flowers are placed in a very long Spike; and the tops of the Stalks are not leafy.

Fig. 7. *a b.*

THIS is a Perennial, native of North-America, and flowers late in September. The Plant is four feet and a half high: the Stalk is of a pale greyish green; and the Leaves are of that kind of greyish or bluish green we see in many of the Sea Plants. The Flowers are larger than in many others, and of a very good, though not bright yellow. They crown the tops of the main Stalk, and of a multitude of Shoots, which rise from the bosoms of the upper Leaves: these form together a long and regular spike, and give the Plant an aspect very different from those whose clusters of Flowers spread out in the usual way, with great breadth.

8. TORTUOUS GOLDEN ROD.

Plate 71. Fig. 8.

Character of the Species.

Solidago flexicaulis.

The Stalk is bent from Joint to Joint: the Leaves are oval and ferrated: the Flowers grow in slight Spikes from their Bosoms.

Fig. 8. *a b c.*

THIS is a North-American, a Perennial, which bears the air with us, and flowers in the beginning of October. The Plant is two feet high; and its Stalk not firm: it is bowed, or knee'd as it were, from Joint to Joint, and is of a yellowish green. The Leaves are of a fresh green; but they also have some tinge of yellowish. The Flowers are pale yellow.

9. BROAD LEAV'D GOLDEN ROD.

Plate 71. Fig. 9.

Character of the Species.

Solidago latifolia.

The Leaves are very broad, oval, smooth, and ferrated: the Stalk is robust: the Spikes of Flowers stand loose and free at the top, in a broad open Cluster.

Fig. 9. *a b c.*

THIS also is perennial, native of North-America; a very handsome robust Plant, flowering late in Autumn. The Stalk is four feet high, and has no Branches but near the top: the Leaves stand free and open; and are of a deep, but not dusky green. The Flowers grow on long free spiky Stalks, crowning the head of the Plant, and rising from the Bosoms of the upper Leaves.

10. SPIRY GOLDEN ROD.

Plate 72. Fig. 10.

WILD GOLDEN ROD.

Character of the Species.

Solidago virga aurea dicta.

The Stalk is jointed, and somewhat weak and angulated : the Flowers stand in short and close Clusters, from the middle to the top of it.

Fig. 10. *abc.*

THIS is a native of our own country : it is frequent on Hampstead Heath, and other dry and high grounds, flowering from August to October ; the common English Golden Rod : it is two feet high : the Stalk is slender and yellowish : the Leaves are of a dusky green : the Flowers are small, and of a fine gold yellow. This Plant is lately found to be excellent in the gravel ; but only this should be used : the American kinds have very different qualities.

11. NAKED GOLDEN ROD.

Plate 72. Fig. 11.

Character of the Species.

Solidago naveborascensis.

The Stalk has only two or three Leaves on it, which are oblong : those from the Root are broad, and have Footstalks : the Flowers stand singly at the tops of the Branches, and are large and yellow.

Fig. 11. *abc.*

THIS is a Perennial, native of New-York and the adjacent parts of North-America, flowering in Autumn : its manner of growth and its aspect are very unlike the generality of the others. The Plant is scarce more than one foot in height ; the radical Leaves are oval, and have long red Footstalks. The Leaves on the Stalk are little more than films. The Flowers are large and yellow, and they stand free and open.

12. HEART-LEAVED GOLDEN ROD.

Plate 72. Fig. 12.

Character of the Species.

Solidago Alpina.

The Leaves are heart-shaped and indented, and they have Footstalks.

Fig. 12. *ab.*

THIS is an European, native of Switzerland and Germany ; and, though the structure of its Cup compels us to rank it among the Golden Rods, its habit would refer it to another Genus : it is the Link by which Nature has connected Golden Rods and the radiated Groundfells. The Plant is two feet high. The Stalk is often deeply tinged with red : the Leaves are of a faint green on the upper side, and they are white and downy underneath : the Flowers are very large, and of a delicate yellow ; and they crown the Stalk in considerable clusters.

13. FEW-FLOWER'D GOLDEN ROD.

Plate 73. Fig. 13.

Character of the Species.

Solidago Doronicum.

The Plant has only one or two Flowers : the Leaves are lanced and indented, and those on the Stalk embrace it at their Bases.

Fig. 13. *ab.*

THIS is a Perennial, native also of Europe, and particularly of Switzerland and Italy. The Stalk is crimson toward the Base, and is lightly ridged. The Leaves are rough and hairy : they are naturally of a deep green ; but the Hairs are so numerous, as to give them a whitish aspect. The Flowers are large, and of a good yellow : they blow in July and August.

14. LINEAR GOLDEN ROD.

Plate 73. Fig. 14.

Character of the Species.

Solidago linifolia.

The Leaves are narrow, all the way of a breadth, and undivided at the Edge. The Flowers form a simple Cluster at the head of the Stalk.

Fig. 14. *ab.*

THIS is a Perennial, native of the southern parts of Europe, and flowers in August. The Stalk is pale and weak : the Leaves are of a delicate green, somewhat paler on the under side than on the upper. The Flowers are of a faint but delicate yellow ; and they are disposed with a beautiful simplicity in one simple cluster on the top of the Stalk.

13. DECURRENT GOLDEN ROD.

Plate 73. Fig. 15.

Character of the Species.

Solidago montana.

The Stalk is angulated : the Leaves are lanced and fawed at the Edge ; they run down the Stalk for a considerable length from the Base.

Fig. 15. *ab.*

THIS is a native of the south of France, a Perennial ; flowering on the dryest and most exposed spots of ground from August to October. The Stalk is edged, and as it were rib'd : Its natural colour is a faint green, but toward the ground usually, and sometimes all the way up, it is stained with crimson. The Leaves are of a pale, but not disagreeable green ; and the Flowers are of a beautiful faint yellow.

G E N U S.

G E N U S XVI.

S I M S O N.

E R I G E R O N.

Character of the Genus.

The Cup is cylindric : the Scales are awly, upright, and equal. The Rays of the Flower do not spread, but stand upright, and are narrow.

Plate 74. *o a a.*

1. SIDE-FLOWERING SIMSON.

Plate 74. Fig. 1.

Character of the Species.

Erigeron viscosum.

The Flowers stand singly on Footstalks from the bosoms of the Leaves: the Cups are rugged.

THIS is a Perennial, native of the southern parts of Europe, and flowers in August. It is a yard high: the Stalk is firm and harsh: the Leaves are of a pale but not unpleasing green: they are harsh to the touch, and at the same time clammy; for they have hairs and glands intermixed on their surface. The Flowers are placed singly on Footstalks, which rise from the bosoms of the Leaves; and they are yellow. The Cups are very apt to decay, and grow rotten; in which case they have a coarse aspect.

2. LINEAR SIMSON.

Plate 74. Fig. 2.

Character of the Species.

Erigeron Carolinianum.

The Leaves are long, and linear, with a simple, undivided Edge. The Flowers spread in a wide bunch.

Fig. 2. *a b.*

THIS is a Perennial, native of Carolina, a singular and not unelegant Plant; flowering in September. The Stalk is two feet high: the Leaves are simple, narrow, and neither jagged, filmy, nor hairy at the Edge. The Flowers are small and yellow: they stand upon the top of the Stalk in a simple and somewhat open head.

3. CLUSTERY SIMSON.

Plate 74. Fig. 3.

Character of the Species.

Erigeron Canadense.

The Leaves are narrow: the Flowers stand at the head of the Stalk, in a divided and thick Cluster.

Fig. 3. *a b.*

THIS is a little Annual, native of North-America; but now found wild in many parts of England; the Seeds flying far, and taking root any where. It is a foot high. The Stalk is green; sometimes a little tinged with crimson. The Leaves are of a pale green: the Flowers are small and white. It flowers in June.

4. REVOLUTE SIMSON.

Plate 74. Fig. 4.

Character of the Species.

Erigeron bonariense.

The Leaves turn down at their Base: the radical ones are pinnatifid; and those on the Stalk entire.

Fig. 4. *a b.*

THIS is an Annual, native of Carolina, and flowers in August. It is a foot and a half high; the Leaves are of a good green, but with some tinge of yellowness. The Flowers are of a delicate yellow but small, and not very conspicuous.

5. L A N-

5. LANCED SIMSON.

Plate 75. Fig. 5.

Character of the Species.

Erigeron Philadelphicum.

The Leaves are lanced, and lightly serrated: they embrace the Stem at their Base. The Stalk supports six or eight Flowers.

Fig. 5. a b.

THIS is a Biennial, native of Canada; and flowers in August: it is a small Plant, ten inches or a little more in height. The Stalk is reddish: the Leaves are of a dusky brownish green, and are somewhat hard to the touch. The Flowers stand at the tops of the Stalk, and sometimes of the Branches: they are small, and of a pale blossom colour; a white just tinged with crimson.

6. ALTERNATE FLOWER'D SIMSON.

Plate 75. Fig. 6.

BLUE SWEET FLEABANE.

Character of the Species.

Erigeron acer.

The Leaves are waved: the Flowers stand singly on alternate Footstalks.

Fig. 6. a b.

THIS is a Perennial, a native of our own country; a low but singular, and beautiful Plant. It flowers twice in the year in April and September; and at those two seasons wears a various appearance; in Spring it lies upon the ground; in September it is erect; in April its Leaves are short; in Autumn they are longer: but the Plant is evidently the same: the Stalk is crimson: the Leaves are of a good green naturally, but often stained very much with the red of the Stalk: the Flowers are not small; but they are less conspicuous than in those kinds in which the Rays spread. They are of a very delicate crimson.

7. HAIRY-CUP'D SIMSON.

Plate 75. Fig. 7.

Character of the Species.

Erigeron Alpinum.

The Cups of the Flowers are remarkably hairy.

Fig. 7. a.

THIS is a Perennial, native of Germany and Switzerland, and flowers in August: it is a foot and half high: the Stalk is often reddish, and always lightly hairy: the Leaves are of a faint and dull green: the top of the Stalk is terminated by two or three Flowers: they are of a fine deep crimson, with a tinge of blue; and the down which follows on the Seeds, is not white, as in most Plants, but brown.

8. ONE-FLOWER'D SIMSON.

Plate 75. Fig. 8.

Character of the Species.

Erigeron uniflorum.

The Stalk supports only one Flower, the Cup of which is woolly.

Fig. 8. a.

THIS also is an European, native of the German hills, and most common at the foot of the Swiss mountains. The Stalk is brown: the Leaves are of a dark and strong green: the Flower, which singly terminates the Stalk, is crimson; and is set off extremely by the contrast of colour in the Cup; for that is white and woolly.

9. CILIATED SIMSON.

Plate 76. Fig. 9.

Character of the Species.

Erigeron gramineum.

The Leaves are narrow and linear : their Edge is rough, and armed with a kind of stiff hairs. The Stalk supports only one Flower.

Fig. 9. *a b.*

THIS is a native of Siberia, a dwarfish Plant, which the cold seems to have stunted and half killed. The Stalk is of a brownish green : the Leaves are narrow, like grass, but not of that pleasing green : their Edges are brown and rugged, and there always are a multitude of dead and dry ones, which surround the centre of the Tuft when they are fresh. The Flower is white, with a very slight dash of a faint crimson. It blows in August.

10. GOLDEN SIMSON.

Plate 76. Fig. 10.

Character of the Species.

Erigeron ficulm.

The Cup is longer than the Flower.

Fig. 10. *a.*

THIS is an Annual, a pretty little Plant, native of Sicily, and other of the warm parts of Europe; flowering in August. The Stalk is naturally crimson: the Leaves are of a very dark green, almost blackish; and, the contrast of these two strong colours is very pleasing. The Flowers are of a perfect golden yellow; but they do not make any great figure; for, beside the narrowness and position of the rays, the Cup exceeds them in Length, and in a manner mixes its brown scales among them.

11. EDG'D SIMSON.

Plate 76. Fig. 11.

Character of the Species.

Erigeron camphoratum.

The Leaves are downy, and edged with a thin membranous substance.

Fig. 12. *a b.*

THIS is an Annual, native of Virginia, flowering in September. The Stalk is green, upright, and two feet and a half high: the Leaves are of a very delicate green naturally; but there is a whiteness over them from the down, with which they are coated, and there is also a singular aspect from their cartilaginous Edge. The Flowers are small.

12. WOODY SIMSON.

Plate 72. Fig. 12.

Character of the Species.

Erigeron tuberosum.

The bottom of the Stalk is woody : the Leaves are lanced and narrow.

Fig. 12. *a b.*

THIS is a Perennial, native of Syria, and of some parts of Europe. It flowers in August. The Stalk is woody but slight and short, and the young Branches are green. The Leaves are of a good green, but with some yellowness: the Flowers are large, and are of a very fine yellow.

G E N U S.

G E N U S XVII.

S A N D W E E D.

A N A C Y C L U S.

Character of the Genus.

The Cup is hemispheric: the Scales are flat, oval pointed, and very numerous. The Rays have a flattened tubular Base, and are undivided at the Ends.

Fig. 77. *o a b c.*

1. RECOMPOUND SANDWEED.

Plate 77. Fig. 1.

Character of the Species.

Anacyclus Creticus.

The Leaves are divided and subdivided into flattened Segments.

Fig. 1. *a b.*

THIS is an Annual, native of the islands of the Archipelago, and flowers in July. The Stalks are weak, and lie upon the ground. The Leaves are of a pale but very delicate green: the Flowers are white, with a yellow disk: the Plant rarely exceeds ten inches in the length of the Stalk, and as that is for the most part laid upon the ground: so that the Plant, tho' singular, makes but little figure.

2. PINNATED SANDWEED.

Plate 77. Fig. 2.

Character of the Species.

Anacyclus Orientalis.

The Leaves are winged, and the Leaflets are cut into bristly Segments.

Fig. 2. *a b.*

THIS also is an Annual, native of the East; a Plant of more singularity than beauty. The Stalk is red toward the ground: the Leaves are of a delicate but faint green: the Flowers are large, open, and white with a yellow Disk.

3. GOLDEN SANDWEED.

Plate 77. Fig. 3.

Character of the Species.

Anacyclus Valentinus.

The Leaves are recompound, and their Segments are long and narrow.

Fig. 3. *a b.*

THIS is an Annual, native of Spain, and flowers in July. The Stalk is firm, upright, a foot and a half high, and of a very fine though pale green. The Leaves have the same fresh and pleasing colour; but there is a cast of whitish over them; for they are sprinkled with slight and small hairs. The Flowers are large, and of a perfect gold yellow.

THIS Species is often destitute of Rays: it will be figured in that condition in our succeeding Class.

G E N U S

G E N U S XVIII.

P A R D W O R T.

A R N I C A.

Character of the Genus.

The Cup is flat and spreading: the Scales are long, intermixed, and equal, but have three distinct insertions at the Base. The Rays have filaments without Antheræ.

Plate 78. *a b c*.

1. PAIR'D-LEAVED PARDWORT.

Plate 78. Fig. 1.

Character of the Species.

Arnica Montana.

The Leaves are oval, undivided, and placed in pairs.

Fig. 1. *a b*.

THIS is a Perennial, native of the European hills, and flowers in June. The radical Leaves are large and pale: the Stalk is two feet high: and one Flower usually crowns it at the top. This is large, and of a gold yellow.

2. ALTERNATE PARDWORT.

Plate 78. Fig. 2.

Character of the Species.

Arnica scorpioides.

The Leaves are placed alternate, and are sharply notched at the Edges.

Fig. 2. *a b*.

THIS is a Perennial also, a hardy Plant, native of the hills of Germany and Switzerland, and flowers in May. The Leaves are of a pale green, somewhat downy, soft, and velvety to the touch: the Stalk is tender, downy, and about ten inches high: the Leaves on it have the same pale colour, and the same softness. The Flowers are large, and of a fine yellow.

3. LANCED PARDWORT.

Plate 78. Fig. 3.

Character of the Species.

Arnica maritima.

The Leaves are lanced, and the lower ones jagged. The Stalk has many Flowers.

Fig. 3. *a b c*.

THIS is a native of North-America, a robust and stout Plant of four feet high; flowering in August and September: it loves a moist soil, and thrives best where it is in the reach of the influence of salt water. The Leaves are of a bluish green: the Flowers are large, and of a fine yellow.

4. EGG-LEAV'D PARDWORT.

Plate 78. Fig. 4.

Character of the Species.

Arnica crocea.

The Leaves are egg-shaped, and indented, and are smooth on the surface.

Fig. 4. *a*.

THIS is a native of the Cape of Good-Hope; a singular and not inelegant Plant. The Stalk is green and weak, though somewhat hard: it seldom rises to more than a foot and a half; and the Leaves are of a greyish green; and the Flowers of what we call an orange scarlet, large and very beautiful.

5. PINNATIFID PARDWORT.

Plate 78. Fig. 5.

Character of the Species.

Arnica gerbera dicta.

The Leaves are pinnatifid, and the Segments are rounded.

THIS also is a native of the Cape, a Perennial flowering in August. The Stalk is brown; The Leaves are covered with a kind of down, of the colour of rust of iron. The Flower is yellow.

6. FINE CUT PARDWORT.

Plate 78. Fig. 6.

Character of the Species.

Arnica coronopifolia.

THIS also is a native of the Cape; and flowers in Autumn. The Stalk is weak: the Leaves are of a dusky green, and the Flower is of a pale yellow.

G E N U S

G E N U S XIX.
S C E N T W O R T.
E R I O C E P H A L U S.

Character of the Genus.

The Cup spreads: the Scales are oval, and few in number. The inner range are flat; the second a little hollowed, and the outer more hollowed: the Rays are few.

Of this Genus we know only one Species.

Plate 79. *o a b c.*

CLUSTERY LEAV'D SCENTWORT.

Plate 79. Fig. 1.

Character of the Species:

Eriocephalus Africanus.

The Leaves are three pointed, and grow in Clusters.

Fig. 1. *a b.*

THIS is a woody perennial Plant, native of the Cape of Good-Hope, and flowers in October. The Stalk is brown, and a yard high: the Leaves are white and downy: they grow thick clustered together, and are irregular in their form, some being simple, and others cut into three or five parts at the end: the Flowers are of a pale but delicate crimson: they stand upright and hollow.

G E N U S XX.
S P H E R E W O R T.
S P H Æ R A N T H U S.

Character of the Genus:

The Cup is globose: the Scales are sharp-pointed and permanent: the Florets are collected in small clusters within their general Cup, and these Clusters have also their Cup composed of five Scales: the Rays are so short that they are scarce visible.

Plate 79. *o a b c.*

Of this Genus we also know only one Species.

I. ALATED SPHEREWORT.

Plate 79. Fig. 2.

GLOBE FLOWER.

Character of the Species.

Sphæranthus alatus.

The Leaves stand alternate, and run down the Stalk with a large Border.

Fig. 2. *a b c.*

THIS is a native of the East-Indies, a very beautiful as well as singular Plant; flowering in July and August: the Stalk is of a pale green, tender, and a foot high: the Leaves are of a very strong and very dark green: they run down the Stalk with Films of the same colour, which have a very beautiful appearance. The Flowers are large and crimson.

G E N U S XXI.

G U M T H I S T L E.

A T R A C T Y L I S.

Character of the Genus.

The Cup is oval: the Scales are very numerous, lanced, and convergent.

Plate 80. *a b c*.

1. WOODY GUM THISTLE.

Plate 80. Fig. 1.

Character of the Species.

Atractylis fructicosa.

The Leaves are oblong, dented, oval, and prickly: the Stalk is woody.

Fig. 1. *a b*.

THIS is a Perennial, native of the Cape of Good Hope; a very beautiful Plant, flowering in August. The Stem is woody and brown, and the young Shoots are tender: the Leaves are of a pale but pleasing green, and the Flowers are of a gold yellow: they stand singly at the tops of all the Branches. The Plant is a yard high, and spreads into a handsome figure.

2. STALKLESS GUM THISTLE.

Plate 80. Fig. 2.

Character of the Species.

Atractylis gummifera.

The Flower rests upon the ground: the Leaves which surround it are prickly.

Fig. 2. *a b*.

THIS is a Perennial, native of the warmer parts of Europe, and of the East, a very singular Plant. The Leaves rise only from the root; for the Plant is wholly destitute of Stalks: they are of a fine strong green, and very beautiful. The Flower appears in the centre, resting upon the ground: it is large and elegant: the Rays are white, and the Disk is yellow. This Plant abounds with a gummy juice; whence the name of the Gum Thistle is very improperly added to it.

3. LEAFY-HEADED GUM THISTLE.

Plate 80. Fig. 3.

Character of the Species.

Atractylis humilis.

The Leaves are finnated, and there is a spreading leafy head under the Flower.

Fig. 3. *a b*.

THIS is a Perennial, native of the southern parts of Europe and of the East, flowering in July. The Stalk is a foot and a half high, green, but stained with crimson toward the Base. The Leaves are of a dark, shining, green: The Flowers are large, and of a delicate crimson; two or three of these crown the Stalk; and they gain fresh Beauty from the leafy Involucrum, or mantle which is placed under them.

4. LINEAR GUM THISTLE.

Plate 80. Fig. 4.

Character of the Species.

Atractylis cancellata.

The Leaves are linear, and dented.

Fig. 4. *a b*.

THIS is an Annual, a little Plant, native of Spain and Italy: It flowers in August. The Stalk is weak, green, and not more than five inches high: the Leaves are of a strong green, but with somewhat of a greyish tinge. The Flowers are crimson: their Rays are often wholly wanting; but the whole surface of the Cup being netted, has an elegant appearance. It flowers in August.

G E N U S

G E N U S XXII.

ROUGHWEED.

A M E L L U S.

Character of the Genus.

The Cup is rounded; the Scales are roughly set together; oblong, hard, nearly equal, and pointed; the Rays are numerous, and not at all cut or divided at the end.

Plate 81. *a b.*

1. SCATTERY ROUGHWEED.

Plate 81. Fig. 1.

Character of the Species.

Amellus lychnites.

The Leaves are placed in pairs; the Flowers stand scattered over the tops of the Branches: one standing on each Footstalk.

Fig. 1. *a b.*

THIS is a Biennial, native of Jamaica; a very pretty Plant: the Stalk is firm, and of a deep green, often tinged with crimson half way up from the ground. The Leaves are of a strong green, but with some natural mixture of a brownish tinge, and often something of the redness of the Stalk. The Flowers are large, and of a fine yellow: their Cups are brown, especially at the edges of the Scales. It flowers in August.

2. UMBRELLA'D ROUGHWEED.

Plate 81. Fig. 2.

Character of the Species.

Amellus umbellatus.

The Leaves are woolly underneath: the Flowers are spread in manner of an Umbrella.

Fig. 2. *a b.*

THIS also is a Biennial, native of Jamaica; and flowers all the latter part of the summer. The Stalk is upright, firm, and of a yellowish green; but soften'd by a slight down. The Leaves are pale on the upper side, and whitish and downy underneath. The Flowers stand in a large flat cluster on the top of the Stalk, in manner of an umbrella.

G E N U S XXIII.

LEAFWORT.

P E C T I S.

Character of the Genus.

The Cup is cylindric; its Scales grow together, and become foliaceous and unequal. The Rays are few and divided lightly at the top.

Plate 81. *o o a b.*

1. EDG'D LEAFWORT.

Plate 81. Fig. 3.

Character of the Species.

The Leaves are linear, and have a rough Edge, with short stiff Hairs.

Fig. 3. *a b.*

THIS is a Biennial, native of Jamaica, and flowers in July and August. The Stalk is of a pale green: the Leaves have a brown edge, and the Flowers are yellow.

2. NAKED LEAFWORT.

Plate 81. Fig. 4.

Character of the Species.

Pectis linifolia.

The Leaves are narrow, but simple, even, and unarmed at the Edge.

Fig. 4. *a b.*

THIS also is a native of Jamaica, a Biennial; flowering in August. The Stalk is usually crimson toward the lower part: the Leaves are of a pale but pleasing green: the Flowers are of a fine yellow.

G E N U S.

G E N U S XXIV.

W H I T E W E E D .

C A R P E S I U M .

Character of the Genus.

The Cup is short and umbilicated; its Scales are narrow, and nearly equal, and it is surrounded at the Base by a leafy Involucrum, or crown.

Plate 82. *a a b*.

1. HEADED WHITEWEED.

Plate 82. Fig. 1.

Character of the Species.

Carpesium cernuum.

The Flowers stand only on the top Branches, and they droop a little.

Fig. 1. *a b*.

THIS is a Perennial, native of Italy, and flowers in August. The radical Leaves oval, wrinkled, a little downy, soft to the touch, and of a pale green. The Stalk is a foot and a half high, and is also downy, whitish, and soft to the touch: the Flowers grow only on the tops of the Branches, which thicken where they are inserted: they are of a fine pale yellow: sometimes naked.

2. SIDE-FLOWER'D WHITEWEED.

Plate 82. Fig. 2.

Character of the Species.

Carpesium abrotanoides.

The Flowers rise in the bosoms of the Leaves, all up the sides of the Stalk.

Fig. 2. *a*.

THIS is an Annual, native of China; and flowers in August. The Stalk is firm, hard, and brown. The Leaves are of a dusky green: the Flowers are of a very pale yellow, and are surrounded by dusky Leaves. Sometimes they leave rays, and sometimes after the manner of the former they are naked.

G E N U S XXV.

R E D C U P .

P O L Y M N I A .

Character of the Genus.

The Cup has three ranges of leafy Scales; three in each of the outer, and four in the inner range: all inserted almost in one place at the Base, and appearing nearly as a simple Series.

Plate 82. Fig. 1. *a a b*.

OF this Genus we know only one Species.

1. LARGE FLOWER'D RED CUP.

Plate 82. Fig. 3.

Character of the Species.

The Scales of the Cup are nearly equal to the Rays in length.

Plate 82. Fig. 3. *a a b*.

THIS is a Perennial, native of North-America, and flowers late in Autumn. The Stalk is firm and hard, red toward the ground, but green on the upper part. The Leaves are of a fine but not strong green, and the Flowers are yellow. The Cup often gets a tinge of red, which shews this in a very agreeable opposition. The Rays are often in part wanting, and sometimes entirely.

O R D E R V.

With the general Cup fringed.

G E N U S I.

G R O U N D S E L.

S E N E C I O.

Character of the Genus.

The Cup is formed of one Row of long upright Scales, and has at its Base a Series of short dry Scales which form the Fringe.

Plate 83. *a b.*

1. PINNATIFID GROUNDSEL.

Plate 83. Fig. 1.

Character of the Species.

The Leaves have no Footstalks : they are irregularly pinnatifid. The Rays are very short.

*Senecio triflorus.*Fig. 1. *a b.*

THIS is an Annual, native of Egypt, a Plant of no great beauty ; flowering in July and August : the Stalk is firm and reddish : the Leaves are of a faint green : the Flowers are of a pale yellow, and they appear almost naked : the Rays are so extremely short : yet short as they are, they turn back a little.

2. AMPLEXICAUL GROUNDSEL.

Plate 83. Fig. 2.

Character of the Species.

The Leaves are sinuated, and embrace the Stalk : the Rays are nipt.

*Senecio Egyptius.*Fig. 2. *a b.*

THIS also is an Annual, native of Egypt, and flowers all Summer : it is a foot and a half high : the Stalk is green and tender : the Leaves are of a good green ; the Flowers are yellow : the Rays very bright and delicate : the disk somewhat dusky.

3. LANCED GROUNDSEL.

Plate 83. Fig. 3.

Character of the Species.

The Leaves are lanced and serrated, and slightly embrace the Stalk.

*Senecio lividus.*Fig. 3. *a b.*

THIS is an Annual, native of Spain, and flowers in July and August : the Stalk is upright but tender : the Leaves are of a dull and blackish green : the Flowers are yellow ; but their Rays are short, and they have no great beauty.

4. RAGGED CUP'D GROUNDSEL.

Plate 83. Fig. 4.

Character of the Species.

The Leaves embrace the Stalk, and are deeply sinuated, or divided in three parts : the Cup is ragged.

*Senecio tribolus.*Fig. 4. *a b.*

THIS is an Annual, native of Spain, and flowers in Autumn. The Stalk is firm, brown, and striated, and is a foot and a half high. The Leaves are of a deep but not unpleasant green. The Flowers are yellow.

5. CLAMMY GROUNDSEL.

Plate 83. Fig. 5.

Character of the Species.

THIS is an Annual, native of our own country, and common on dry banks about Blackheath, Hampstead, and here at Bayswater. It is two feet high : the Stalk is greyish and tender : the Leaves are of a greyish green, and the Flowers of a pale yellow. The whole Plant has a remarkably strong smell ; Nature has given this as a testimony of its great virtues. It is now under trial in some cases of importance ; and there is reason to expect the event will be worth the notice of the Public.

STINKING GROUNDSEL.

Senecio viscosus.

6. DOUBLY JAGG'D GROUNDSEL.

Plate 84. Fig. 6.

RAGWORT GROUNDSEL.

Character of the Species.

Senecio sylvaticus.

The Leaves are smooth; they are deeply cut in the pinnatifid manner, and the Segments are sharply cut again.

Fig. 6. a b.

THIS is a Biennial, native of our thickets, and common by road sides, where the hedges run in upon the waste: it is a robust Plant, a yard high. The Stalk is red at the Base: the Leaves are dark green, but hoary underneath: the Flowers bright yellow.

7. BLUE LEAV'D GROUNDSEL.

Plate 84. Fig. 7.

Character of the Species.

Senecio glaucus.

The Leaves are cut into long, simple, narrow Segments, in the pinnatifid manner.

Fig. 7. a b.

THIS is an Annual, native of Egypt, a singular, and not unhandfome Plant: it is a foot or more in height: the Leaves are of a fine blue green; and the Stalk has the same tinge, but paler: the Flowers are of a fine yellow.

8. LONG FOOTSTALK'D GROUNDSEL.

Plate 84. Fig. 8.

Character of the Species.

Senecio hastatus.

The Leaves are pinnatifid, and have very long Footstalks, which embrace the Stalk.

Fig. 8. a b.

THIS is a Perennial, native of Africa, a singular and very beautiful Plant: the Stalk is hard and brown: the Leaves are of a dull green, with some tinge of the same brown about the middle rib and edges. The Flowers are of a gold yellow.

9. CRIMSON GROUNDSEL.

Plate 84. Fig. 9.

Character of the Species.

Senecio elegans.

The Leaves are broad and pinnatifid: the Flowers are large and crimson.

THIS is a Biennial, native of the Cape of Good Hope; but is one of those Plants, which, tho' from so remote a quarter, bear the open air with us all summer. It is two feet high, and spreads into a multitude of Branches: the Leaves are of a dead green, and the Flowers of a most beautiful crimson: it flowers in August.

10. OPEN-LEAV'D GROUNDSEL.

Plate 84. Fig. 10.

Character of the Species.

Senecio squalidus.

The Leaves are pinnatifid, and the Segments are few, narrow, and placed open and far asunder.

Fig. 10. a b.

THIS is a native of Italy and Spain, a Plant of no great beauty, an Annual, flowering in July and August. The Stalk is brown: the Leaves are of a dusky and unpleasing green: the Flowers are yellow.

11. HOARY GROUNDSEL.

Plate 84. Fig. 11.

Character of the Species.

Senecio Scanarenfis.

The Leaves are hoary and pinnatifid, and their Segments are cut and notched again.

Fig. 11. a b.

THIS is a Perennial, native of many parts of the north of Europe, a tall Plant, flowering in August: the Leaves are of a pale green, and hoary: the Flowers are of a bright and delicate yellow.

12. WOOLLY

12. WOOLLY GROUNDSEL.

Plate 85. Fig. 12.

Character of the Species.

Senecio incanus.

The Leaves are lightly pinnatifid, and woolly on both sides.

Fig. 12. a b.

THIS is a Biennial, native of the mountainous parts of Europe, and flowers in September: it is a foot and a half high: the Stalks are whitish: the Leaves are also of a whitish colour, and soft and woolly to the touch: the Flowers are yellow.

13. MULTIFID GROUNDSEL.

Plate 85. Fig. 13.

Character of the Species.

Senecio abrotanifolius.

The Leaves are cut into a multitude of narrow Segments in the pinnatifid form.

Fig. 13. a b.

THIS is a Biennial, native of the Alps and Pyrenæan mountains, and other places in Europe, but not wild here: it flowers in July and August: the Stalk is reddish: the Leaves are of a pale green, and the Flowers are yellow.

14. TWICE WING'D GROUNDSEL.

Plate 85. Fig. 14.

Character of the Species.

Senecio Canadensis.

The lower Leaves are twice winged, the upper simply winged, and the Leaflets linear.

Fig. 14. a b.

THIS is a Perennial, native of North-America; a singular and not unelegant Plant, flowering in September. The Stalk is upright and hollow, and two feet high: the Leaves are of a pale, but somewhat dusky green: the Flowers are yellow, and of a considerable size.

15. RAGWORT GROUNDSEL.

Plate 85. Fig. 15.

Character of the Species.

COMMON RAGWORT.

Senecio Jacobææ.

The Leaves are broad, divided and subdivided, with rounded serrated Segments.

THIS is an Annual, native of our country, and common every where in waste grounds, and on ditch banks, covering them with its spreading heads of golden Flowers all Autumn: it is two feet and a half high: the Stalk is reddish: the Leaves are of a good but not glossy green, and the Flowers are of a strong and fine yellow.

16. GOLDEN GROUNDSEL.

Plate 85. Fig. 16.

Character of the Species.

Senecio aureus.

The radical Leaves are hearted, and have Footstalks: those on the Stalks are pinnatifid.

Fig. 16. a b.

THIS is a very elegant Plant, a Perennial, native of Virginia, and flowers in June: it is two feet high: the Stalk is purplish: the Leaves are of a deep green, with some tinge of brown: the Flowers are very beautiful, and of a fine gold yellow.

17. SWORD-LEAV'D GROUNDSEL.

Plate 86. Fig. 17.

Character of the Species.

Senecio paludosus.

The Stalk is simple; the Leaves are oblong, sharp pointed, sharply serrated, and hoary underneath.

Fig. 17. a b.

THIS is a Perennial, native of the sea coasts of many parts of Europe, a tall and very fine Plant: the Stalk is reddish: the Leaves are of a fine green on the upper side, and whitish underneath: the Flowers are yellow.

18. TWICE SERRATED GROUNDSEL.

Plate 86. Fig. 18.

Character of the Species.

Senecio nemorensis.

The Leaves are doubly serrated, lanced, and hoary underneath, and the Stalk is branched.

Fig. 18. a b.

THIS is a Perennial, native of Germany, and flowers in August: the Stalk is brown; the Leaves are of a dusky green on the upper side; and the Flowers are yellow.

19. SARACEN GROUNDSEL.

Plate 86. Fig. 19.

SARACENS CONSOUND.

Character of the Species.

Senecio Saracenicus.

The Leaves are lanced, ferrated, and smooth on both sides. The Flowers are clustered.

Fig. 19. a b.

THIS is a Perennial, native of the North of England, and of the Swiss mountains; a stately and elegant Plant, flowering in August. The Stalk is green and six feet high. The Leaves are of a delicate green, and elegantly ferrated: the Flowers are small and yellow.

20. FLESHY GROUNDSEL.

Plate 86. Fig. 20.

Character of the Species.

Senecio halimifolius.

The Leaves are egged, fleshy, and dented. The Stalk is woody.

Fig. 20. a b.

THIS is a Perennial, native of the Cape of Good Hope, and flowers in August. The Stalk is woody and brown: the Leaves are thick, fleshy, and of a blue green. The Flowers are of a fine yellow.

21. PRICKLY GROUNDSEL.

Plate 86. Fig. 21.

Character of the Species.

Senecio Byzantinus.

The Leaves are ferrated, and the points of the teeth are thorny.

Fig. 21. a.

THIS is a native of the East, a tall and stately Plant, and flowers in July: it is four feet high: the Stalk is pale green: the Leaves are of a good green: the Flowers are yellow, and very beautiful.

22. RUGGED GROUNDSEL.

Plate 86. Fig. 22.

Character of the Species.

Senecio rigidus.

The Leaves are hearted, bent, oblong, rough, and rugged; and the Stalk is woody.

Fig. 22. a b.

THIS is a native of the Cape, a woody branching Plant of four feet high, and flowers in August. The Leaves are of a good green on the upper side, and pale below. The Flowers are of a fine gold yellow.

23. ARROWED GROUNDSEL.

Plate 86. Fig. 23.

Character of the Species.

Senecio ilicifolius.

The Leaves are arrowed, and the Stalk is woody.

Fig. 23. a b.

THIS also is a Perennial, native of the Cape, and flowers in August: the Stalk is brown: the Leaves are whitish underneath, and the Flowers are yellow.

24. WATER GROUNDSEL.

Plate 86. Fig. 24.

Character of the Species.

WATER RAGWORT.

Senecio aquaticus.

The radical Leaves are harped; the upper one pinnatifid.

Fig. 24. a b.

THIS is a Biennial, native of our ditch sides, and flowers in July. It is two feet high: the Leaves are of a fine fresh green; and the Flowers are yellow.

G E N U S II.

N O O N - F L O W E R.

M E R I D I A N A.

Character of the Genus.

The body of the Cup is form'd of a single row of upright, oblong, pointed scales. The Fringe consists of two ranges of large leafy Films, which turn their points downward.

Plate 87. *a b c.*

OF this Genus there is but one known Species, a very singular and noble Plant. I have named it from the time of day when its elegant Flower opens, which is but for a hour or a little more, at noon; and that only in good weather.

C H E Q U E R ' D N O O N - F L O W E R.

Character of the Species.

The Leaves are some simply lanced, and others pinnatifid: the base of the Flower is beautifully chequered.

Fig. 12. *a b c.*

THIS is a Perennial, native of the Cape of Good Hope, but bears the free air with us all Summer. The Stalks are thick, and tender: they lie upon the ground, and are ten or twelve inches long, and usually redish. The Leaves are of a very delicate strong green on the upper side, and white underneath. The Flower is very large, and of exceeding beauty. Its colour is an orange scarlet, chequer'd at the base with black and white in very regular Figures. It flowers in June, and is easily encreased by cuttings.

THIS Plant has been known but a few years in Europe; and the Gardeners have suppos'd it an *Arctotis*; but it has nothing of that membranaceous edge to the upper scales of the Cup, which is the great distinctive character of that Genus, nor can by any means be numbered with those Plants.

OF THE

HORTICULTURE

HENDON

The first of the great principles of horticulture is to know the soil. The soil is the foundation of the garden, and it is the gardener's duty to know its nature and to adapt his plants to it.

The second principle is to know the plants. The gardener must know the habits of the plants, their requirements, and their diseases. He must also know the value of the plants and the time to plant them.

THE VEGETABLE GARDEN

The third principle is to know the tools. The gardener must know the uses of the tools and how to use them properly. He must also know when to use them and how to keep them in good order.

The fourth principle is to know the weather. The gardener must know the seasons and the weather. He must know when to plant and when to harvest. He must also know how to protect his plants from the weather.

The fifth principle is to know the people. The gardener must know the people who are interested in his garden. He must know their needs and how to satisfy them. He must also know how to work with them.

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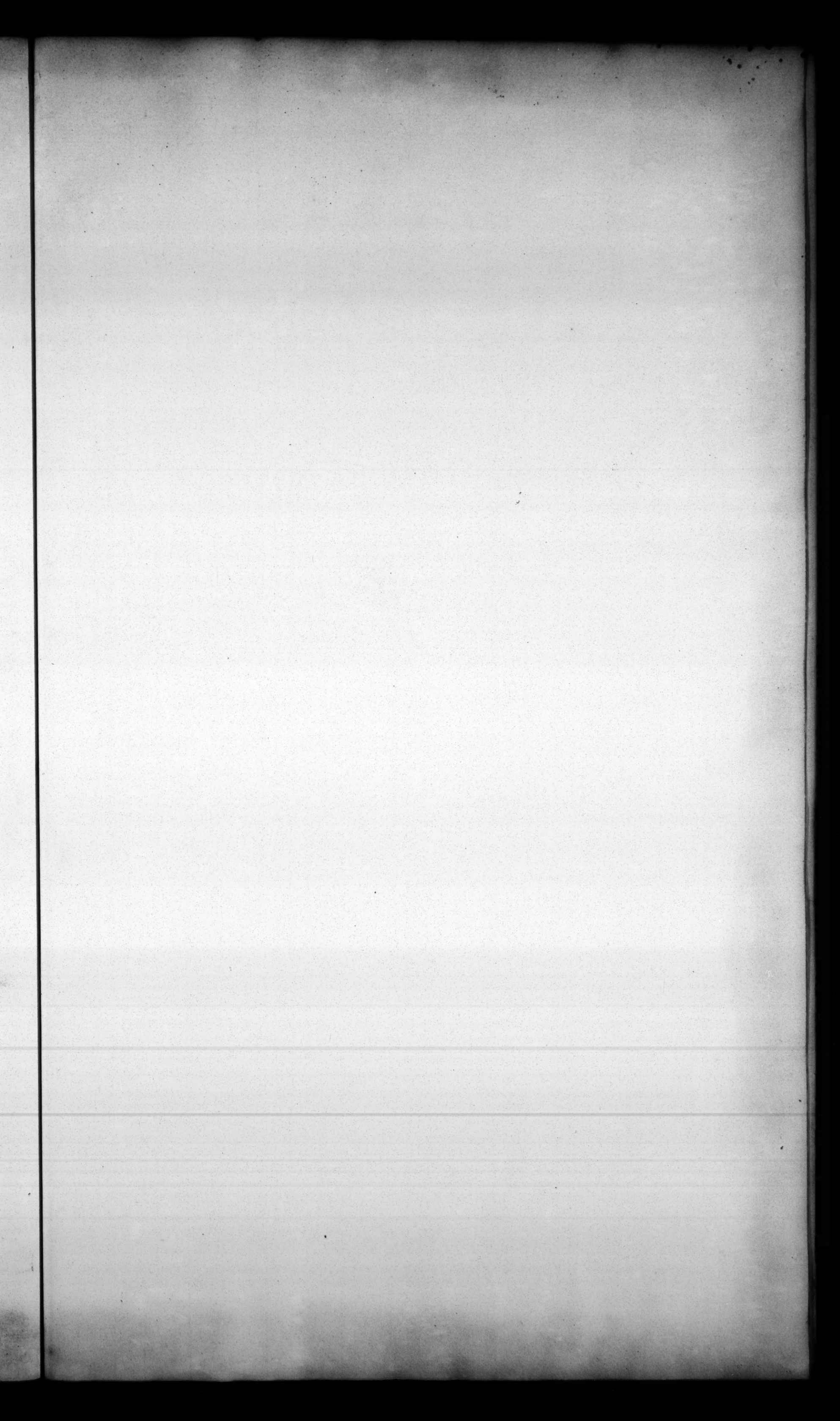
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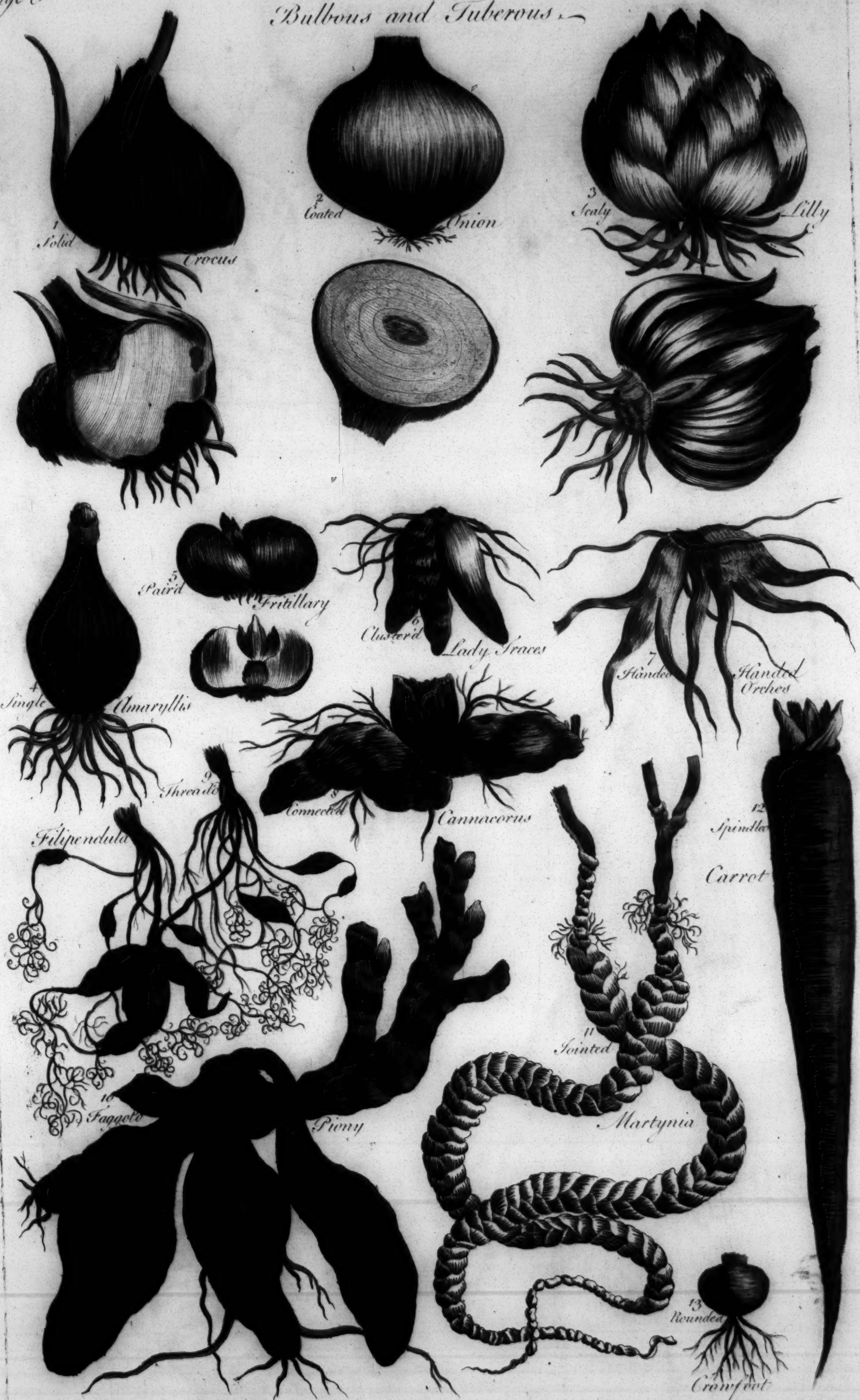


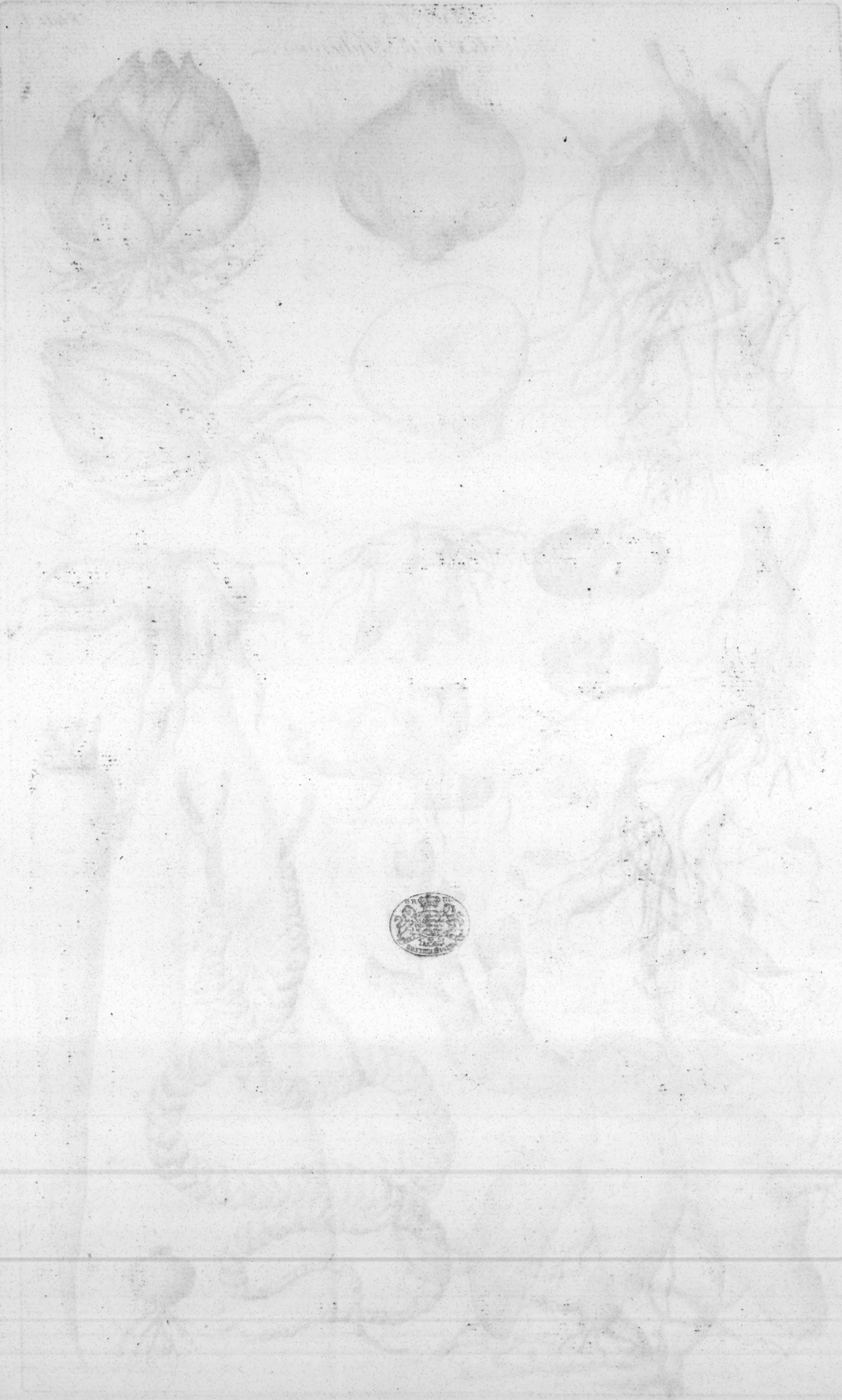
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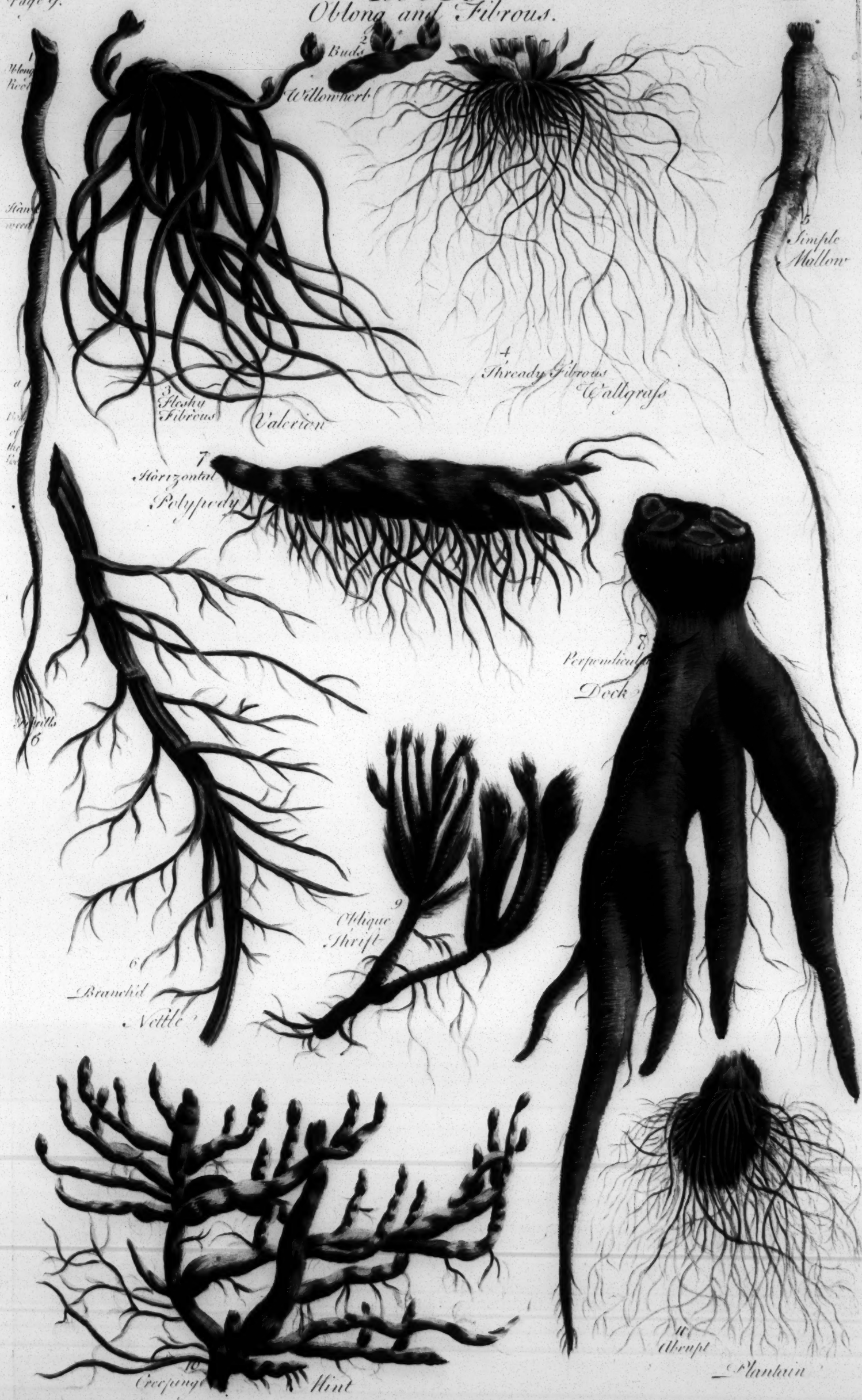


ROOTS
Bulbous and Tuberous





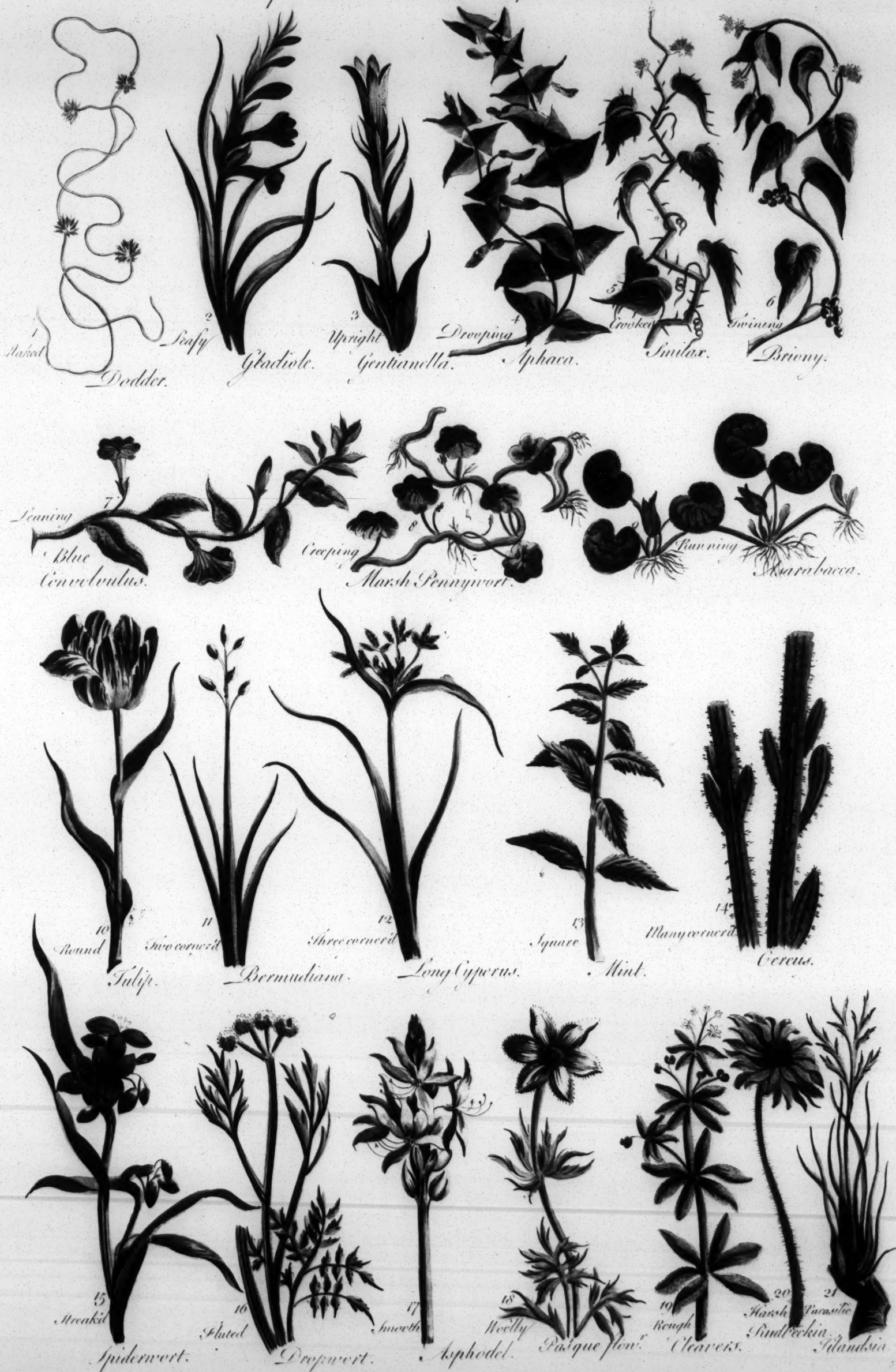
ROOTS
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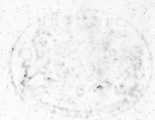


1871



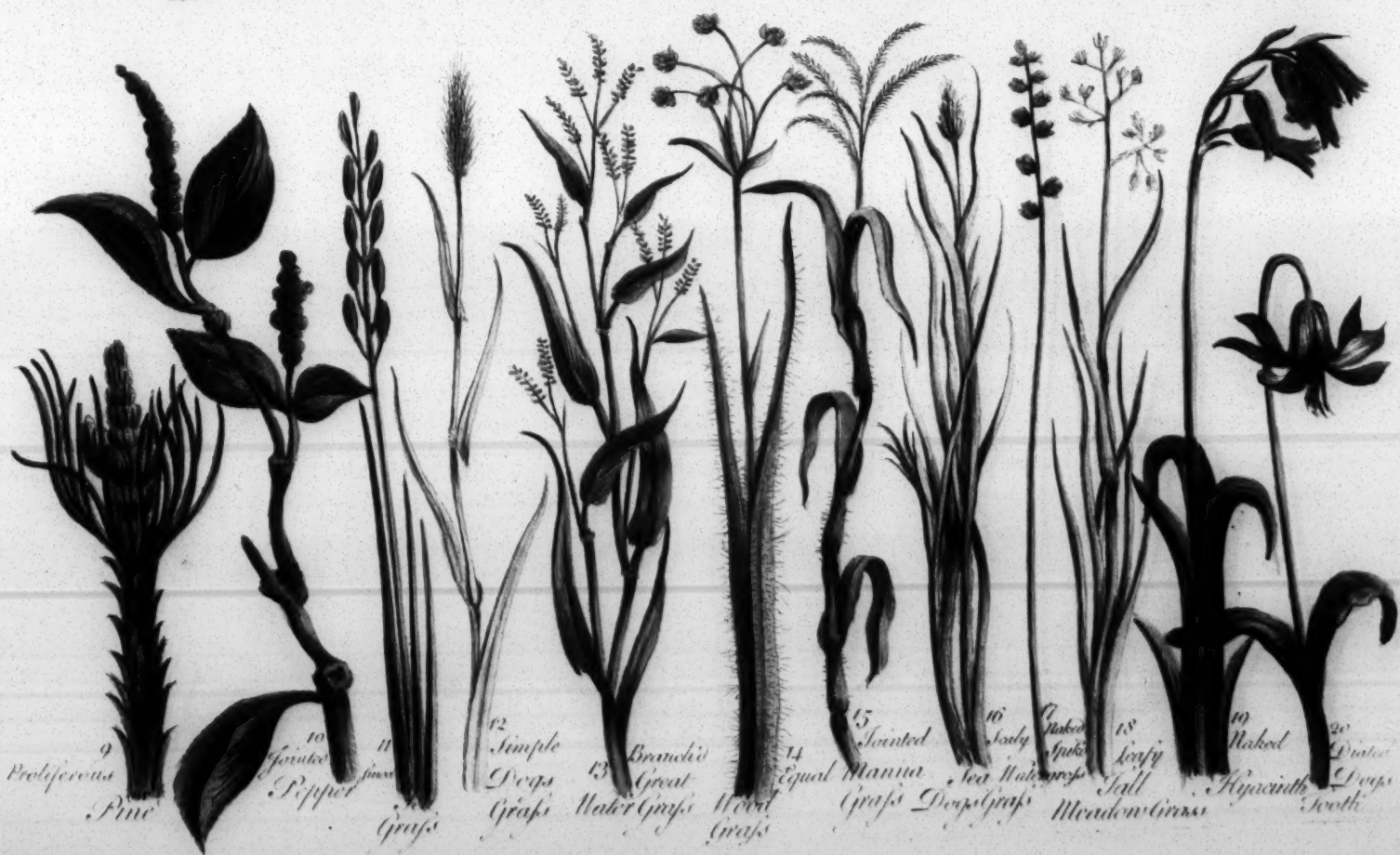
Stems of Plants with their simple Characters.





CAUDICES.

Stems of Plants and Trees with their Branches.





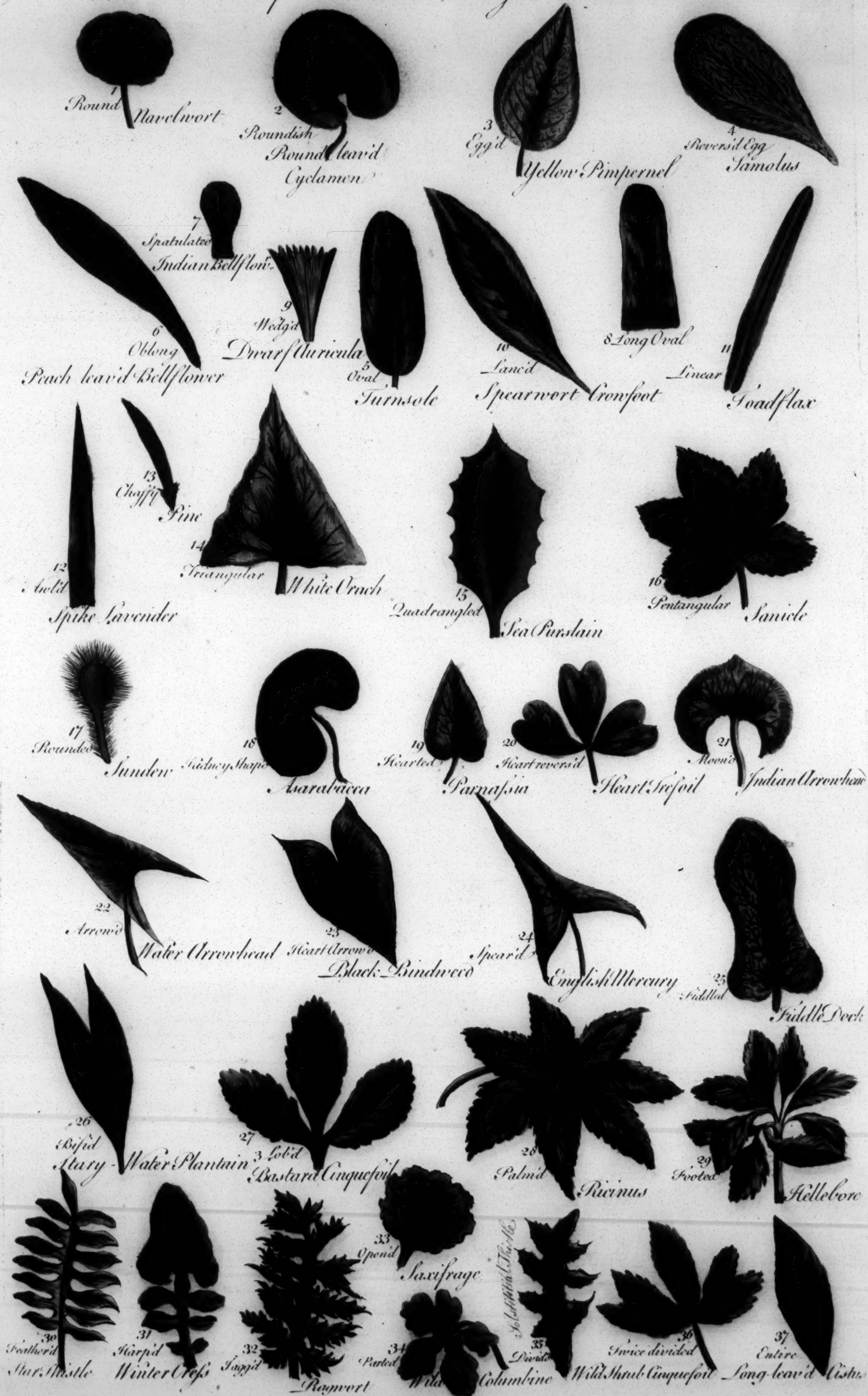
Supports and Appendages to the Parts of Plants.

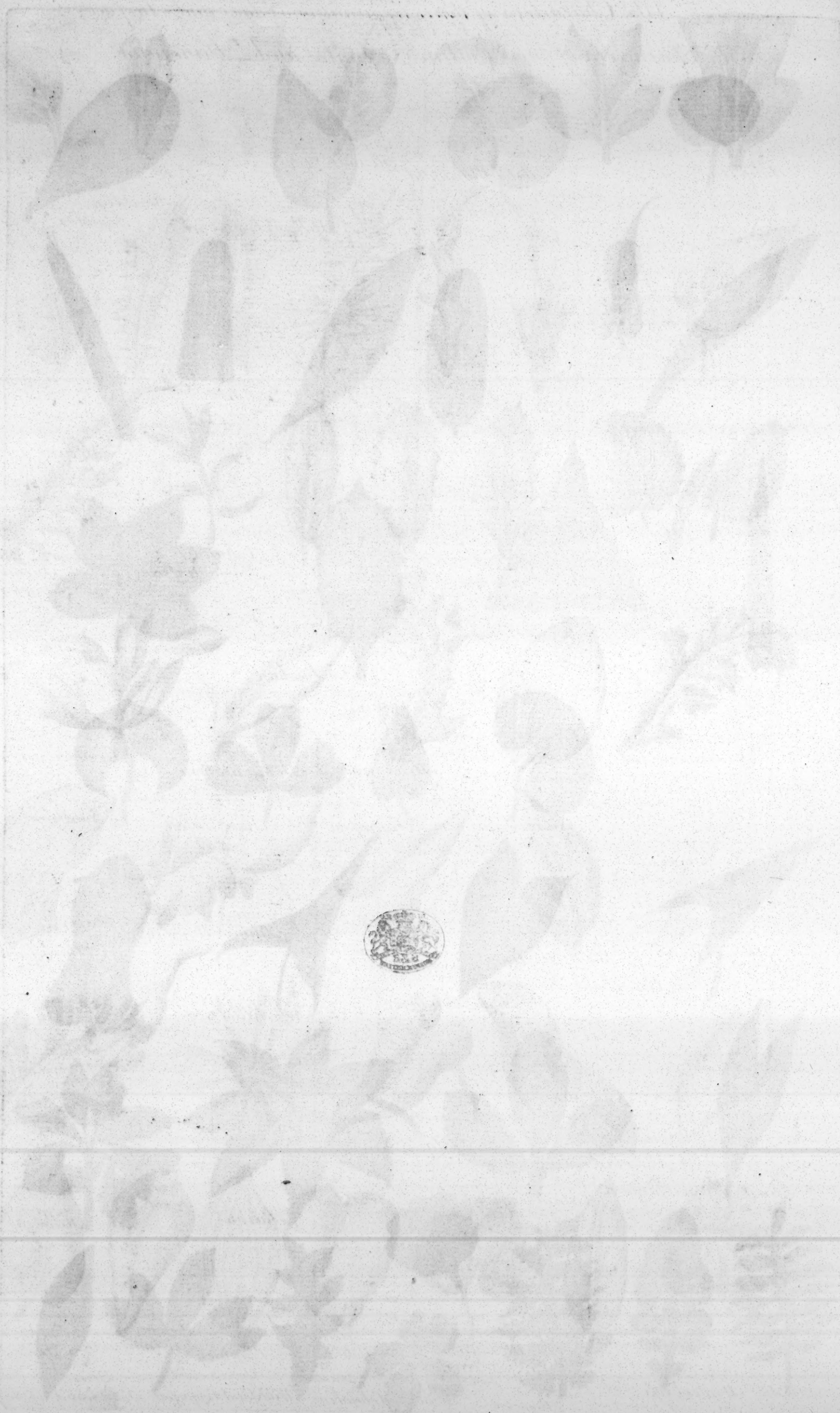


PLANTAE
INDICAE
R. B. R. 1.

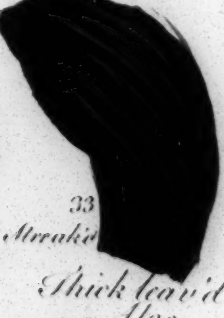
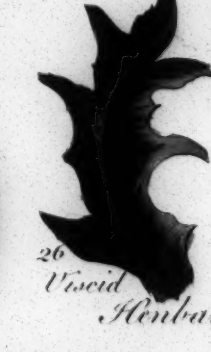
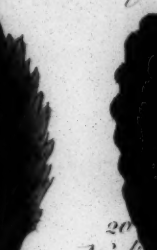
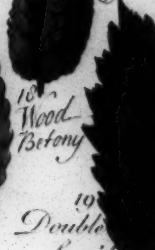
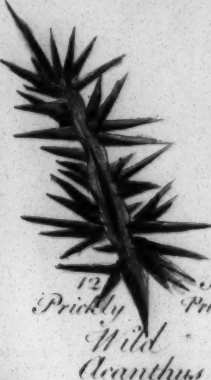
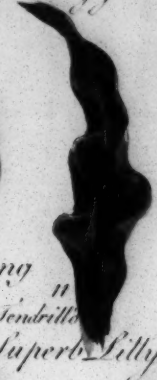


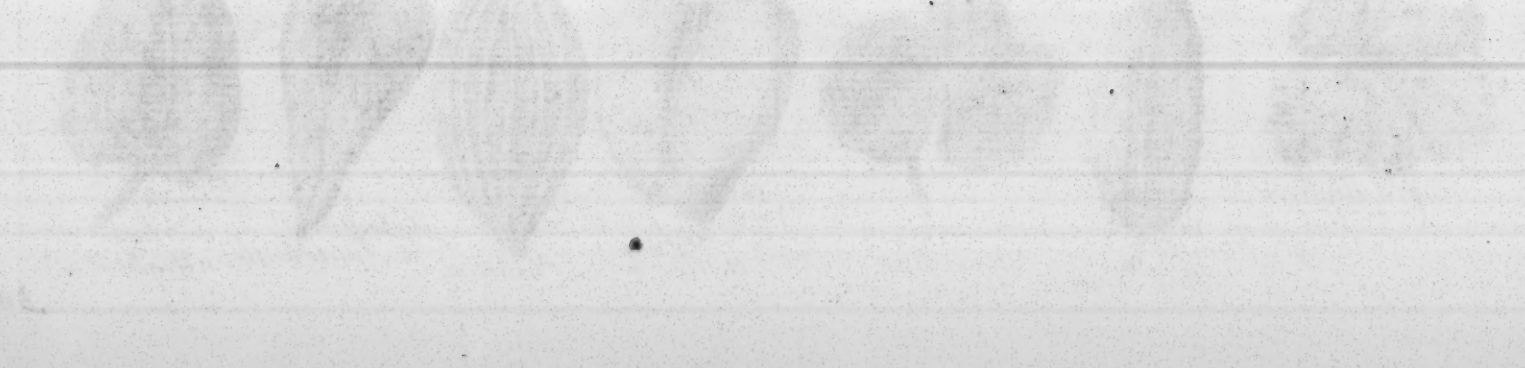
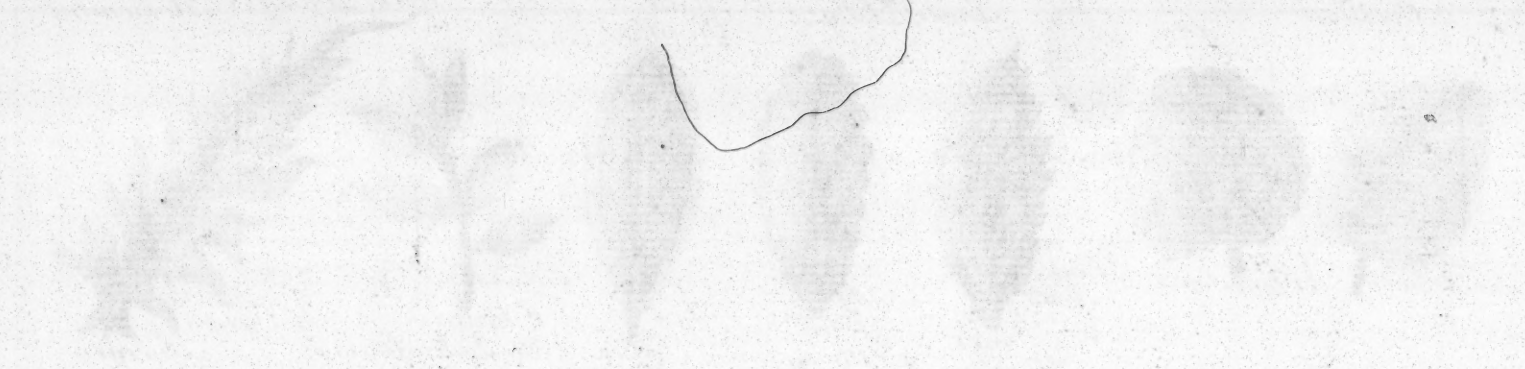
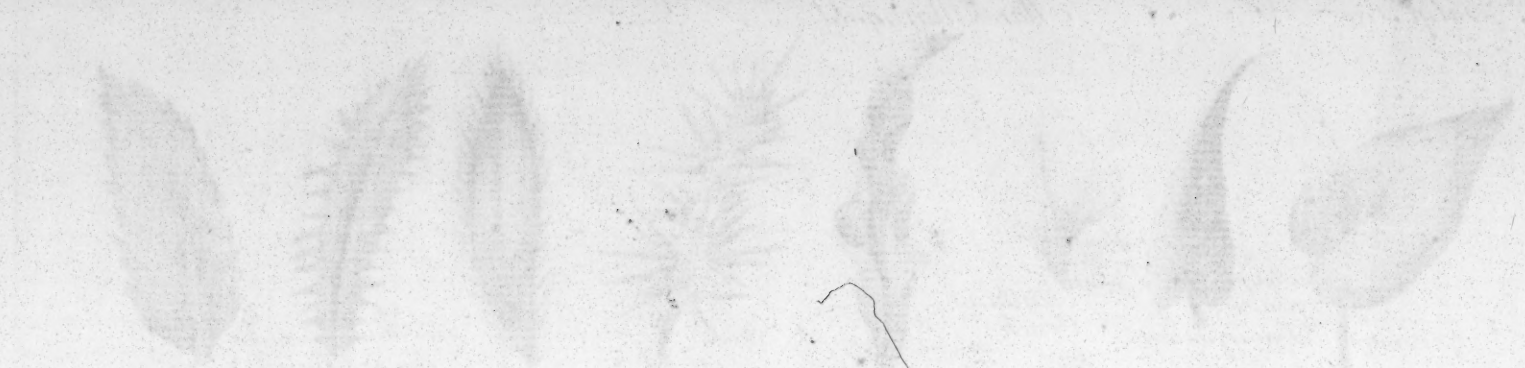
The Characters of their Outlines, Angles and Divisions.





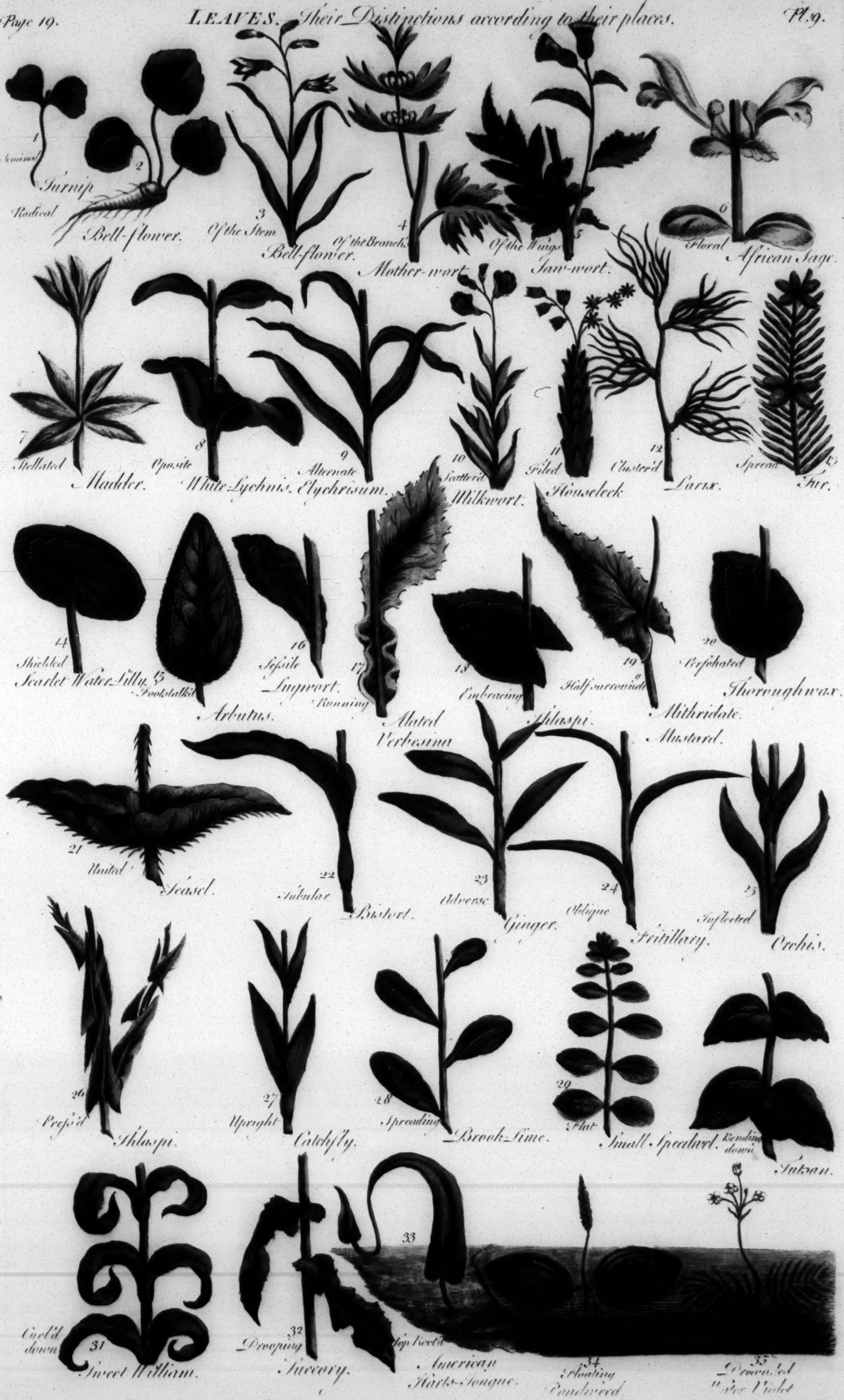
The Characters of their Terminations Edges and Surface





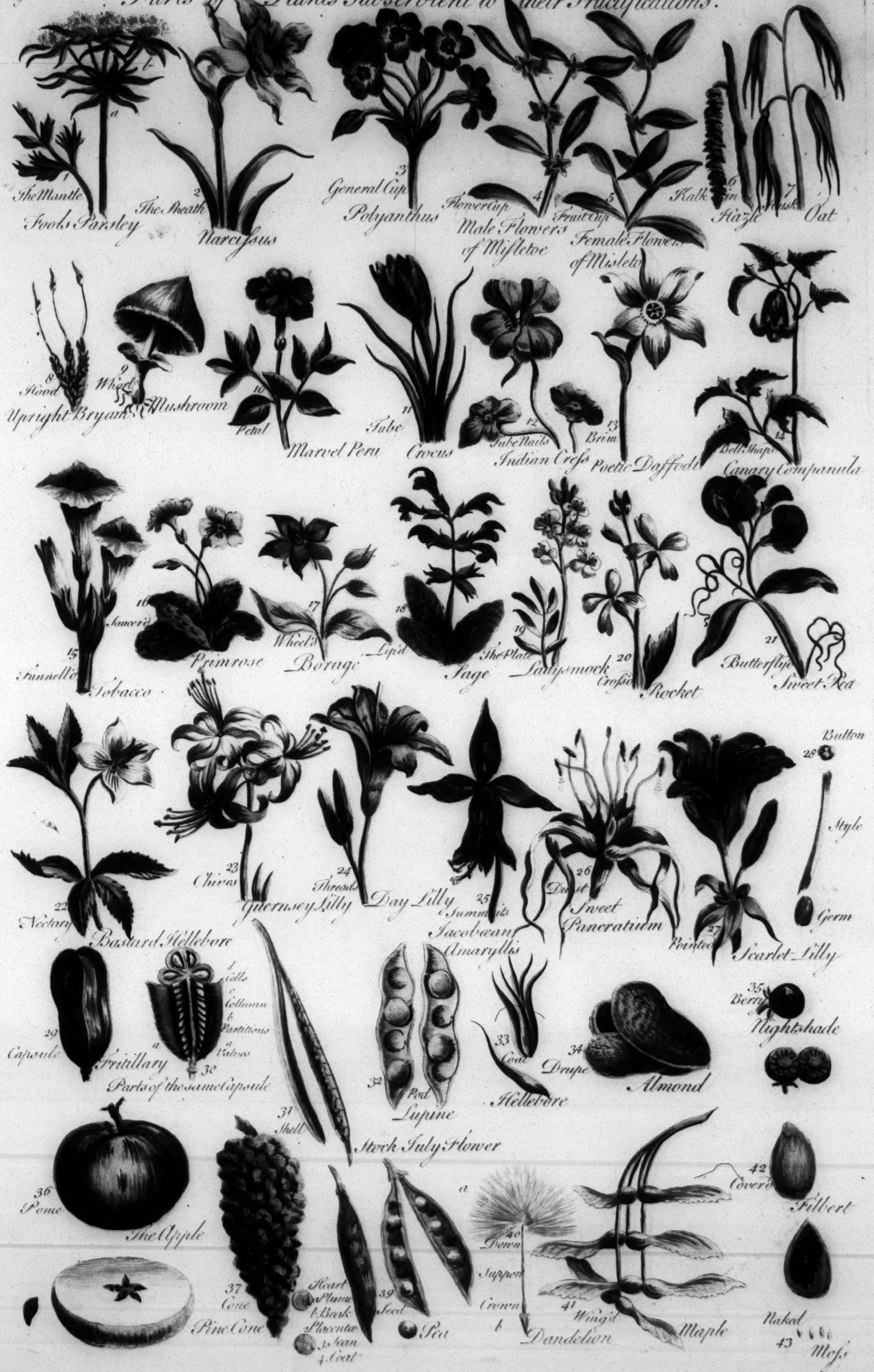






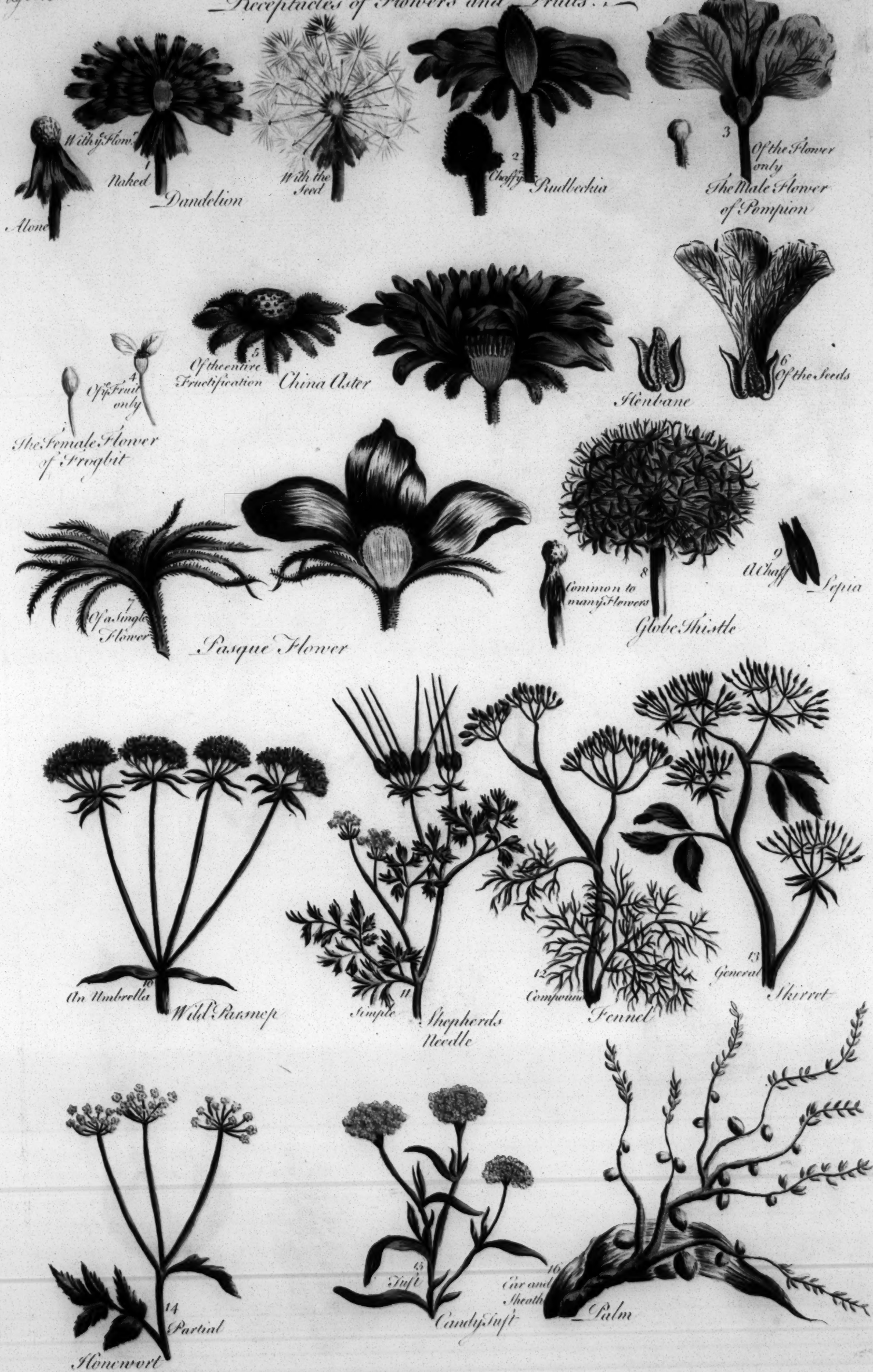


Partes of **PARTES FRUCTIFICATIONIS.**
Plants Subservient to their Fructifications.





RECEPTACULA.
Receptacles of Flowers and Fruits.







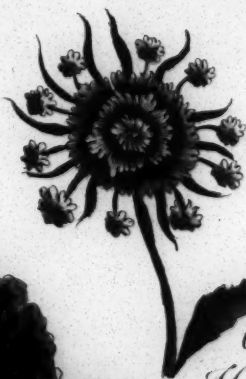
1
Double Tulip



2
Proliferous Rose



4
Rose Willow



3
Childling
Flanweed



5
Oak
Apple

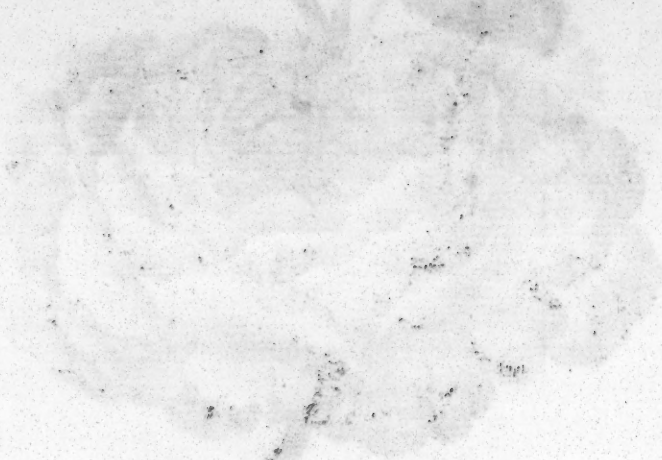
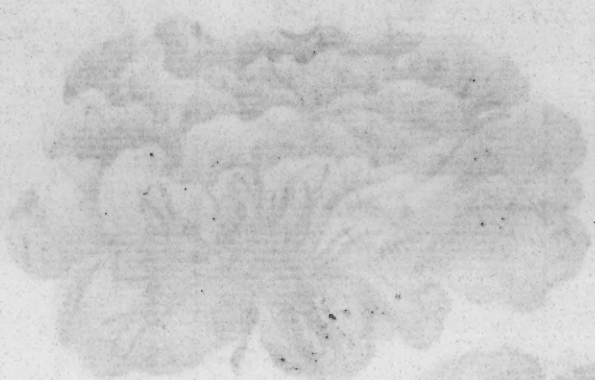


6
Curly Cabbage

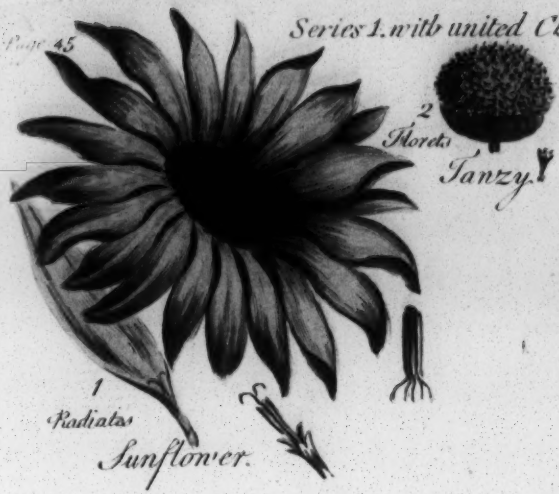


7
Bubbly Lettuce

LETTERS OF FORTITUDE



Series 1. with united Chives.



CHARACTERS
OF
CLASSES.

Series 2. with distinct Chives.



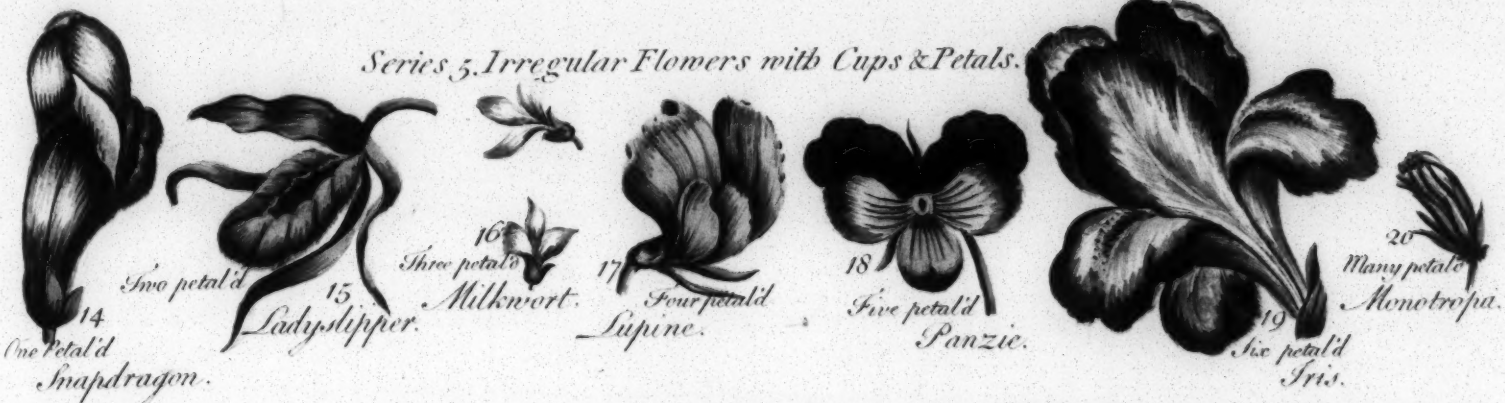
Series 3. On Pedicles from one Point.



Series 4 Regular Flowers with Cups and Petals.



Series 5. Irregular Flowers with Cups & Petals.



Series 6. Flowers Compos'd of Petals without Cups.



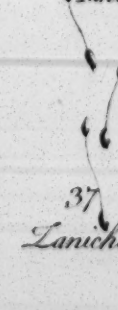
Series 7. Flowers Compos'd of Cups without Petals.



Series 8. Chaffy



Series 9. Thready



Series 10. with Chives & Pointal on distinct Plants.



Series 11. Leafy



Series 12. Scaly

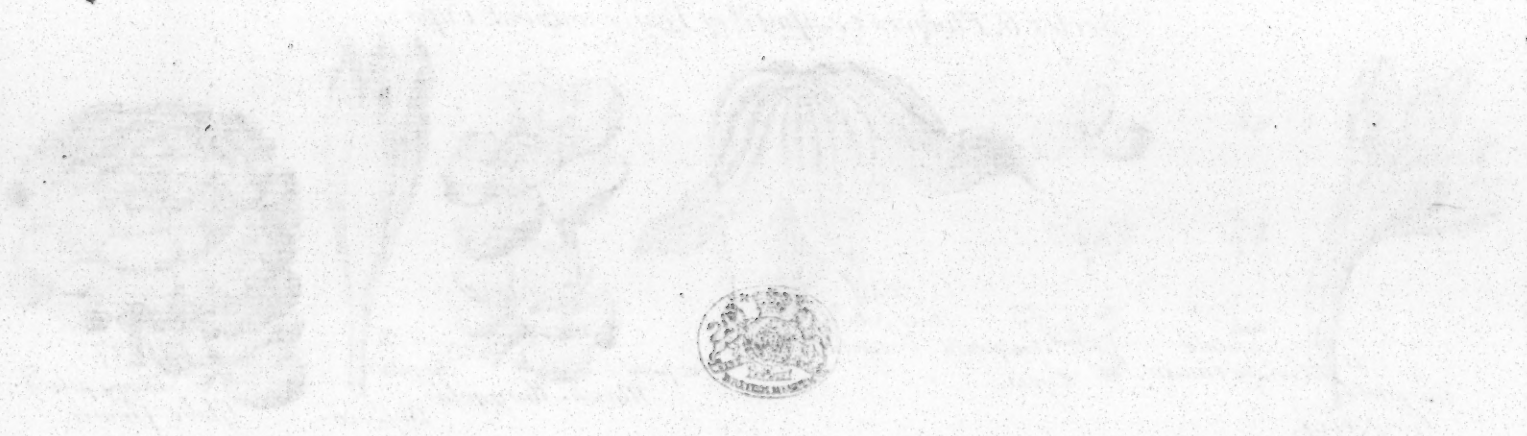


Series 13. without Leaf or Scale.



Series 14. Sea Plants







A Tubulated Floret
without its Chives.



4

The
united Chives
Separated from its Floret.



A Tubulated Floret
with its Chives.



5

The
united Chives
with the Style?



A Tubulated Floret
cut open?



6

The
Chives with
one Separated?



7

A
Common Cup?



8

A
Cup with the Receptacle?



9

A
Receptacle



10

A
Entire Cup?



11

A
Simple Cup.



12

A
Double Cup?



13

A
Tiled Cup?



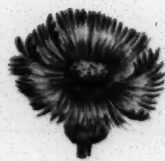
14

A
Fringed Cups?



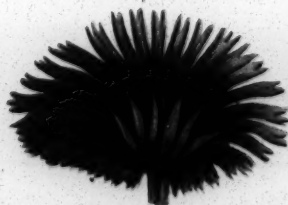
15

Tagetes
in
its Cup.



16

Celosia
in
its Cup.



17

Marygold
in
its Cup.



18

Aster
in
its Cup.



19

Senecio
in
its Cup.





Generic
Character.



Spreading French Marygold.

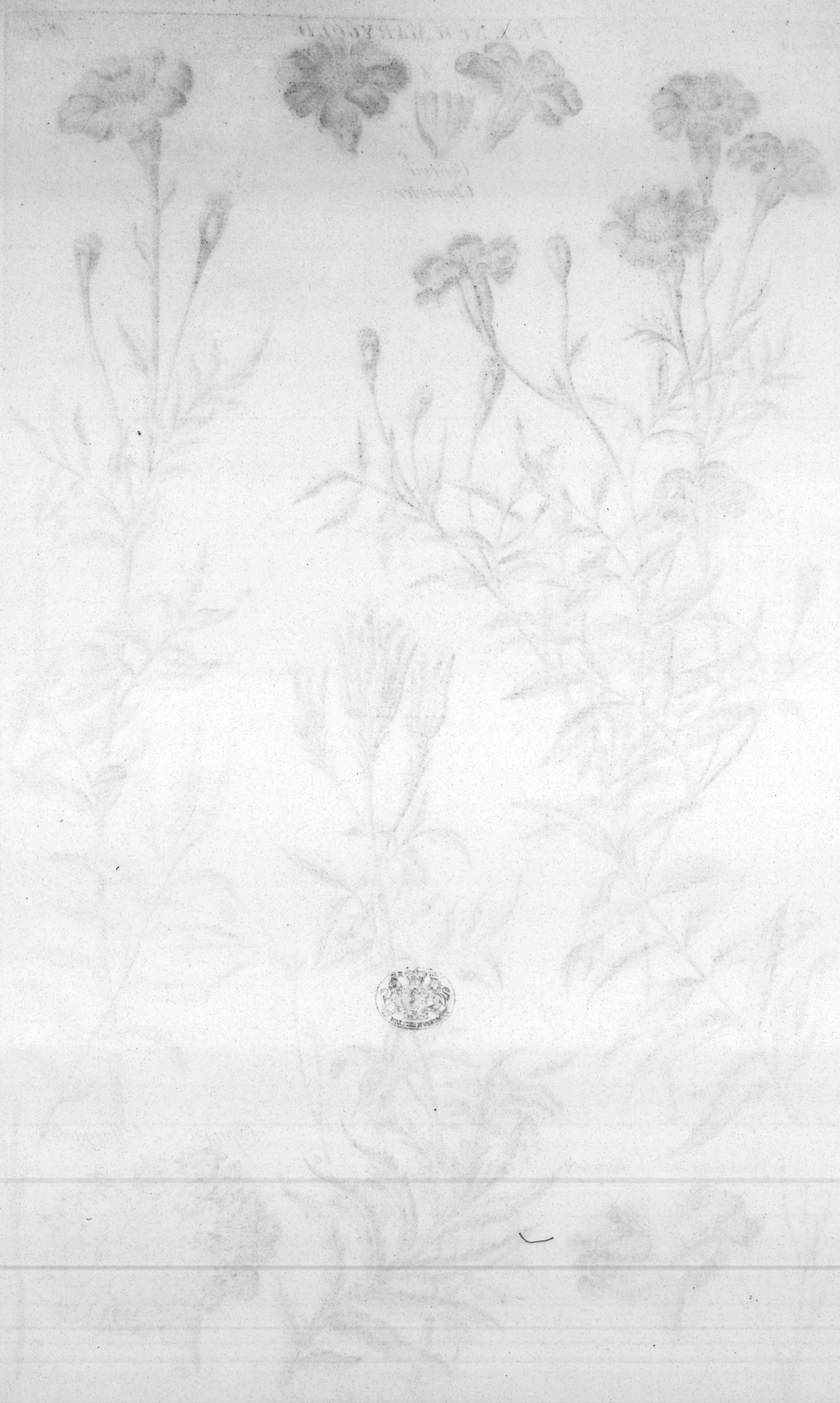


Petting French Marygold.



Upright French Marygold.







Generic Character.



Silene David Seggrom?



Heart David Seggrom?



Egg David Seggrom?



Amplexicaul Seggrom



SEGGROM.



5
Marsh Seggrom.



8
Pinnatifid Seggrom



6
Umbrellad Seggrom.



7
White haired Seggrom.









Generic Character.

1
Drooping Hemp Agrimony.

2
Verticillate Hemp Agrimony.

4
Simply Winged Hemp Agrimony.

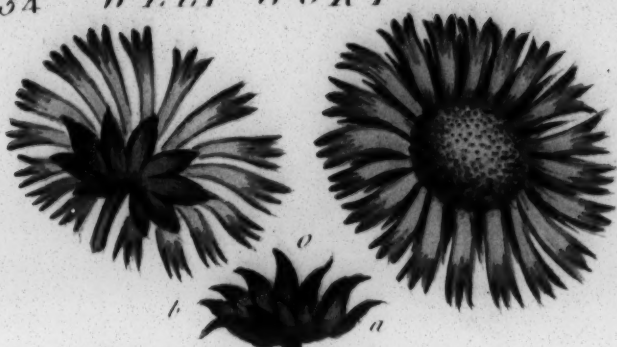
3
Twice Winged Hemp Agrimony.

5
Bulby Hemp Agrimony.









Generic Character



Generic Character



Planted Welt Wort



Palmetto Hard Seed



SWAMP FLOWER.



MAID-WEED.







Generic
Character.

Large-cup'd Base Sunflower.

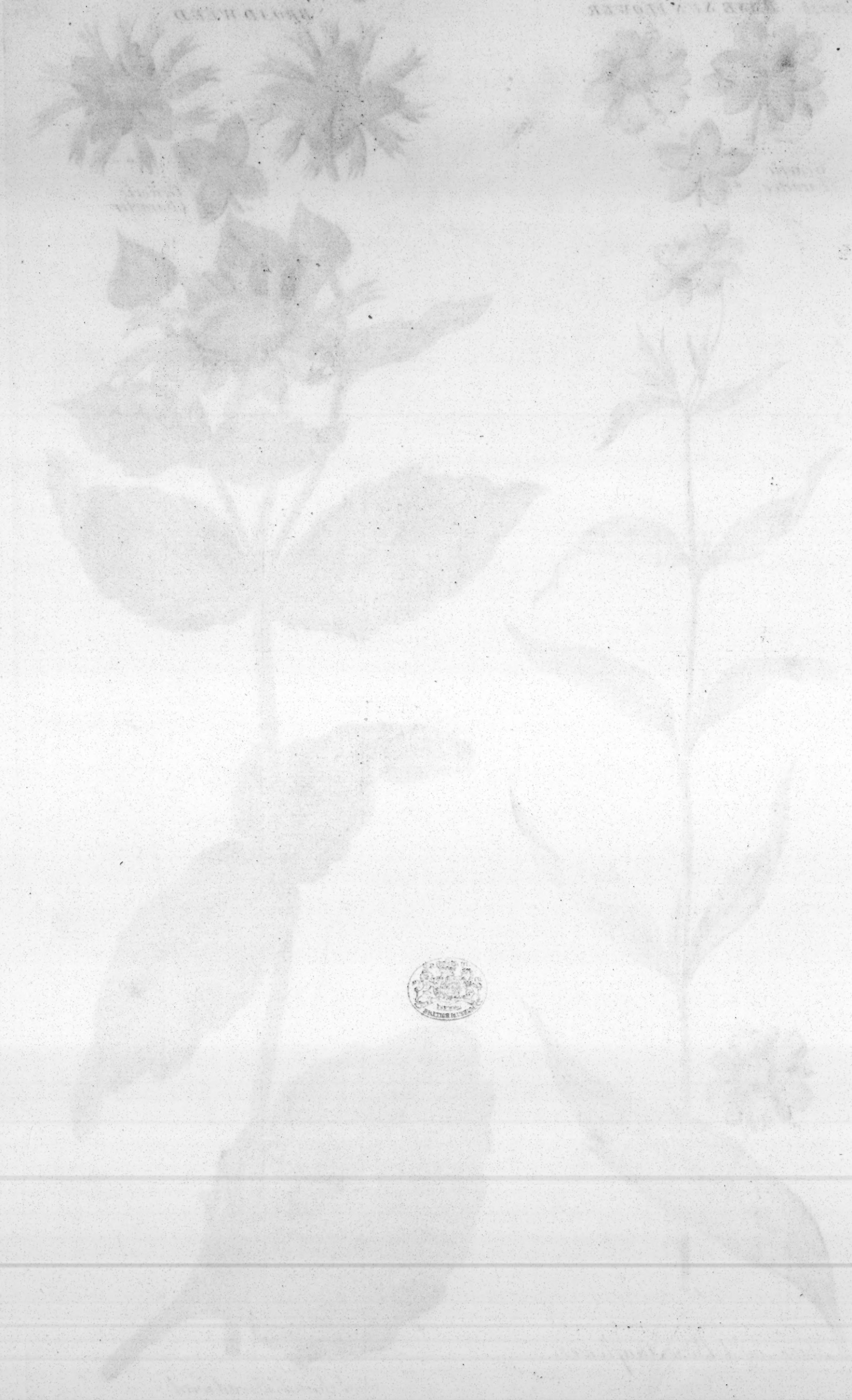


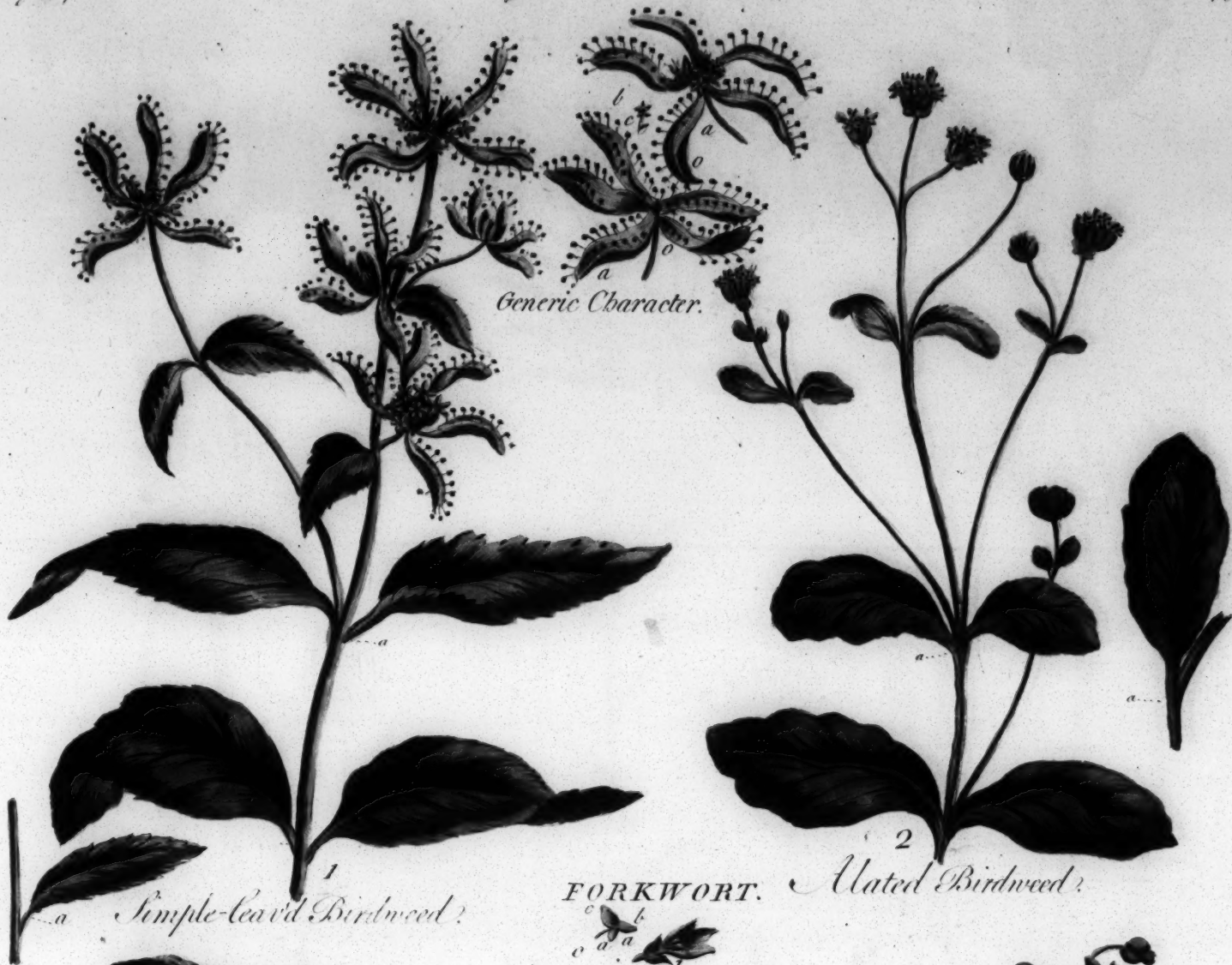
Generic
Character

Oval-leav'd Broad-weed.

THE GARDEN

THE GARDEN





FORKWORT.
Generic Character







Spreading Leopardsbane

Gray Leopardsbane

Ramping Leopardsbane





Generic Character.



1
Naked Daisy COMMON DAISY.



2
Leafy Daisy

THE
LIBRARY
OF THE
MUSEUM
OF
COMPARATIVE ZOOLOGY
AND ANATOMY
OF THE
MUSEUM OF
COMPARATIVE ZOOLOGY
AND ANATOMY





1
*Alternate-leaved
Stone-weed.*



3
*Procrumbent
Stone-weed.*



2
*Clustery
Stone-weed.*



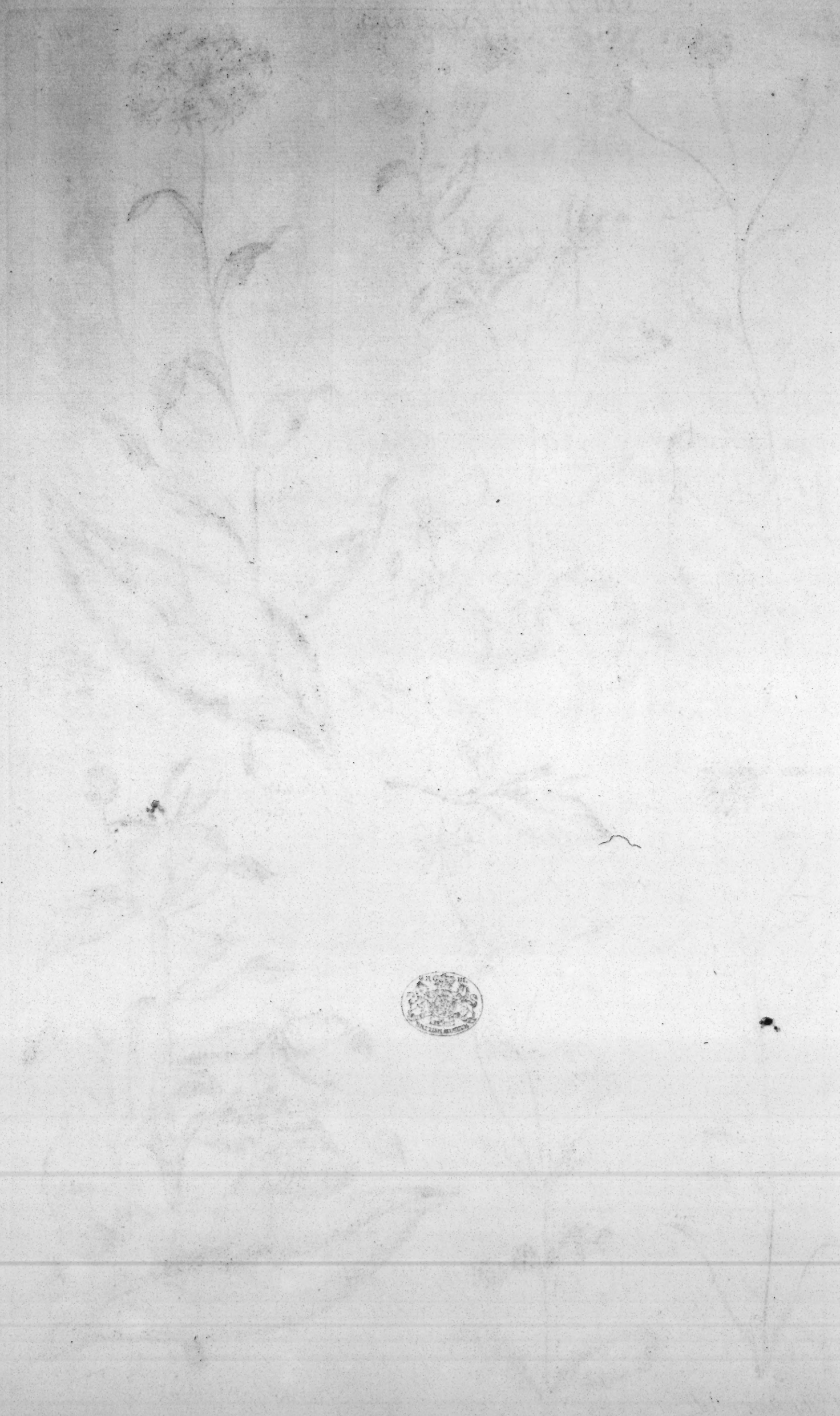
5
Woolly Stone-weed.



4
Long-footstalked Stone-weed.



6
Broad-leaved Stone-weed.





Oval-leaved Sky-Flower.

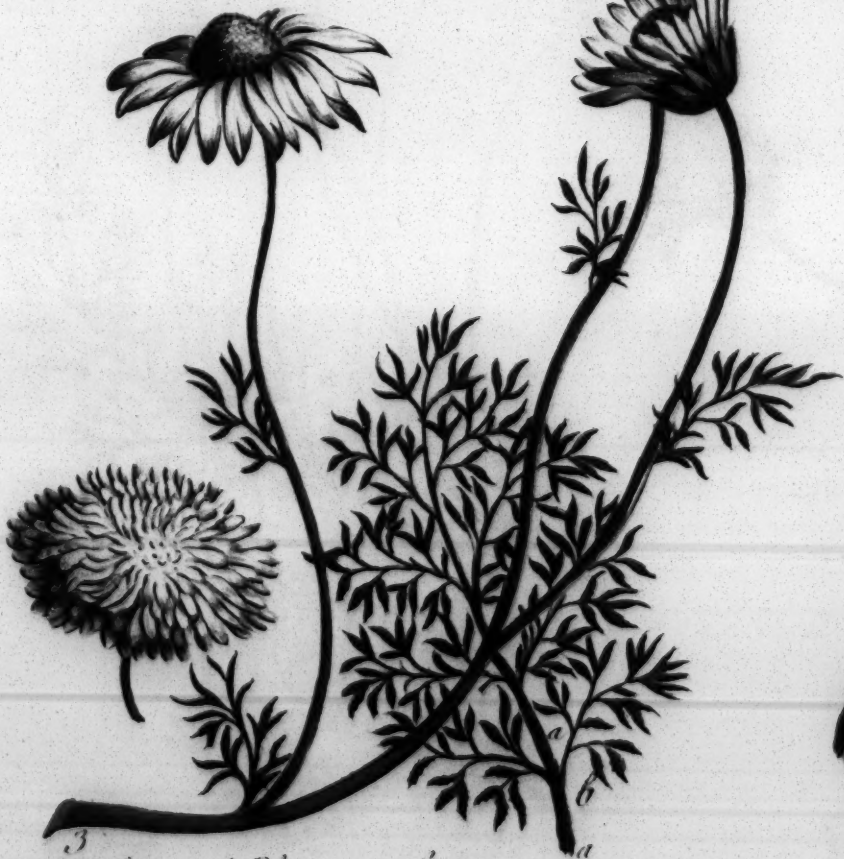




Generic
Character.



Full Chamomile



Sea-side Chamomile



Prickly Chamomile



Woolly Chamomile





Field Chamomile.



Mottled Chamomile.



Sweet Chamomile.



Chian Chamomile.





Trifid Chamæmyle.



Fatid Chamæmyle.

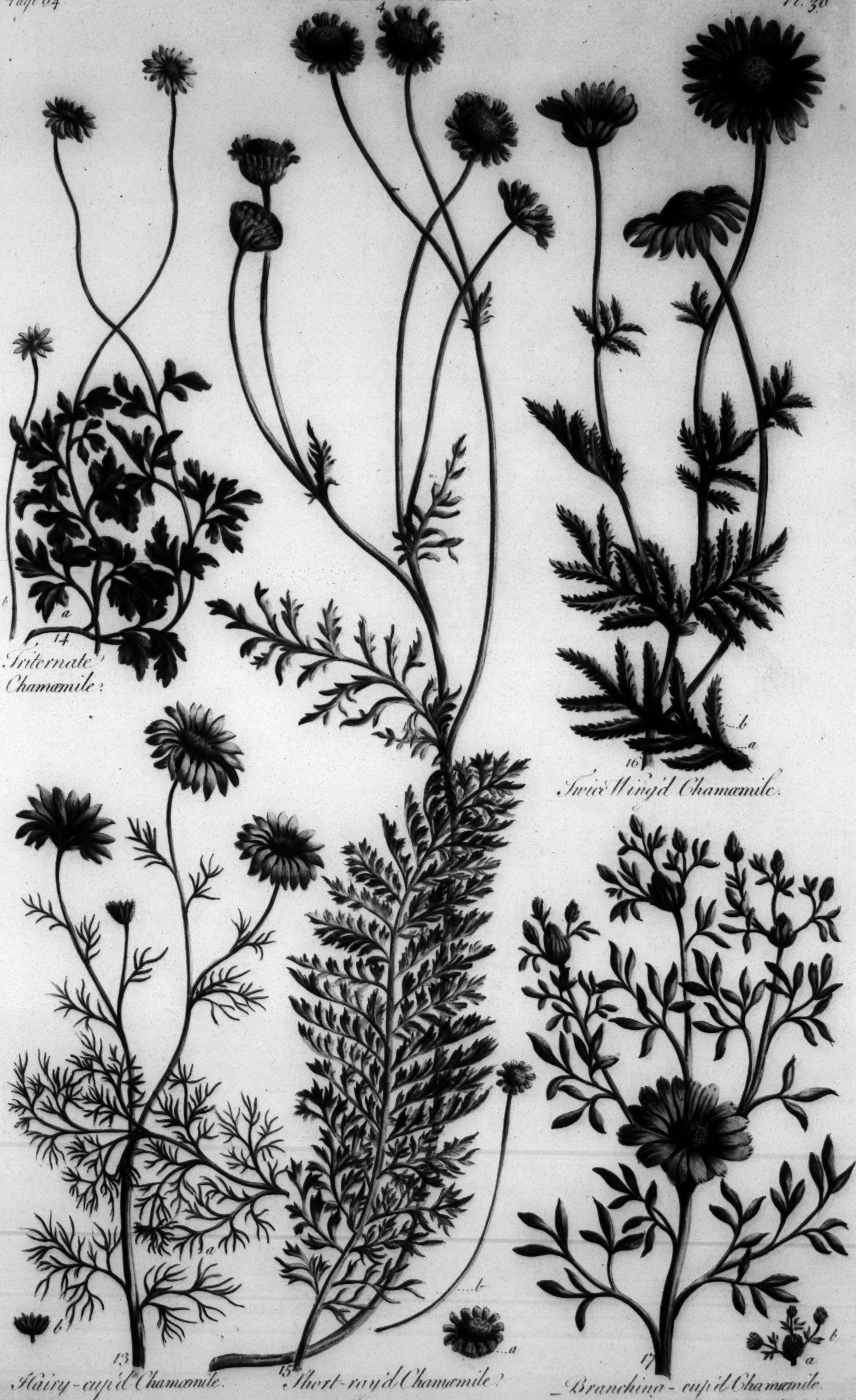


Simple-leav'd Chamæmyle.



Pellitory Chamæmyle.









Downy May-weed?



Chamney Mayweed?





*Small flower'd
Marygold.*

Naked, Stalk'd Marygold.

*Orange
Marygold.*

Ethiopian Marygold.

Grassy-leaved Marygold.



DWARF SUN FLOWER.

Fig.







Cluster-leaved Tick-Seed

Fernate-leaved Tick-Seed



White Tick-Seed



Liriculate Tick-Seed







TWIN-WEED.



Generic Character.



Winged Twin-weed?









Generic Character

Smooth Sun-flower.

Linear Sun-flower.

Long-rooted Sun-flower.

Short-stemmed Sun-flower.

Spreading Sun-flower.



SUN-FLOWER.
2



Giant Sun Flower.

Annual Sun Flower.

Long-stemmed Sun Flower.



Dwarf Sun Flower.



Red-disk'd Sun Flower.

















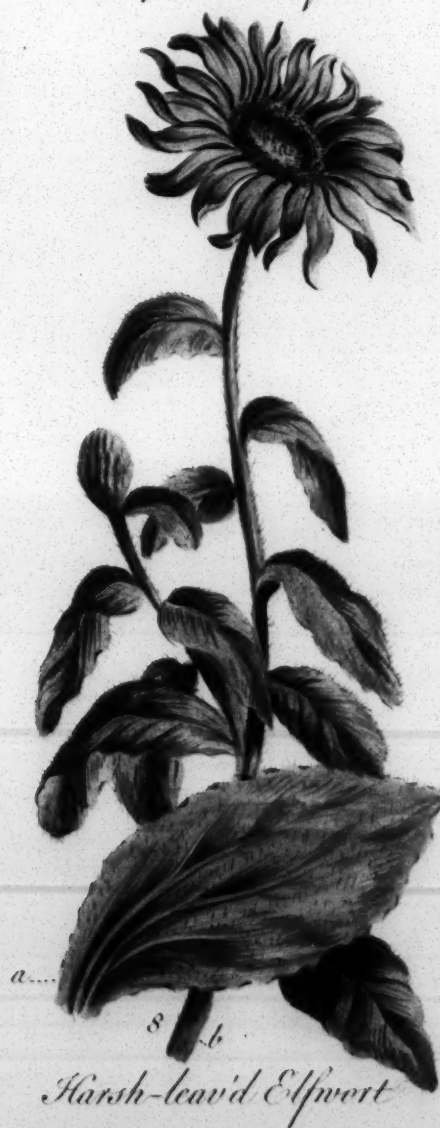
5
Clammy Elfwort?



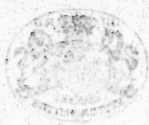
6
Half-naked Elfwort?



7
Ridg'd Stalk'd Elfwort?



8
Harsh-leav'd Elfwort





Curled Elf-wort. 9



Nervous Elf-wort. 10



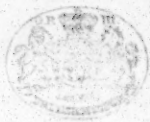
Three pointed Elf-wort. 11



Woolly Elf-wort. 13



One flower'd Elf-wort. 12





Trifid Corn-Marygold.



Amplexicaul Corn-Marygold.



Deep-cut Corn-Marygold.

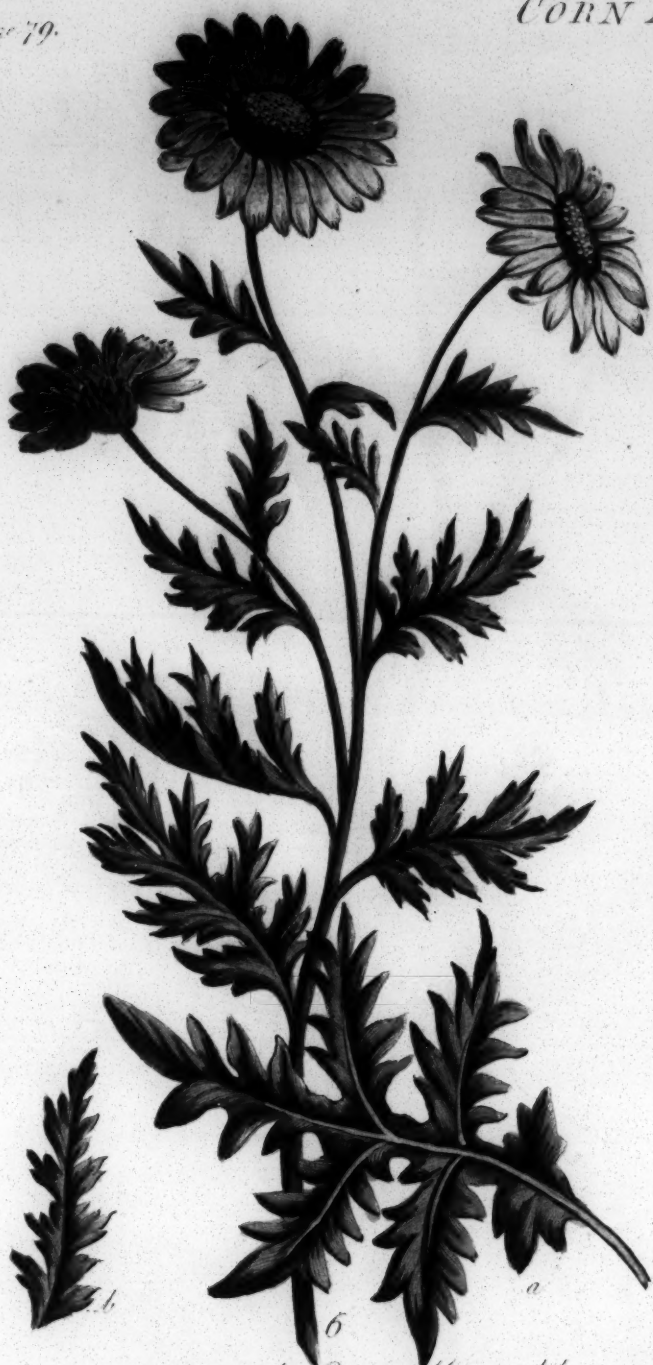


Grassy Corn-Marygold.



Spatulad Corn-Marygold.





Palmated Corn Marygold.



Pinnatifid Corn Marygold.



Oval-leav'd Corn Marygold.



Wedge-leav'd Corn Marygold.





Glaucous Corn-Marygold.



Multifid Corn-Marygold.



Twice-winged

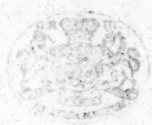
Corn-Marygold.



*Clustery
Corn-Marygold.*



Prickly Corn-Marygold.



MUDWEED.



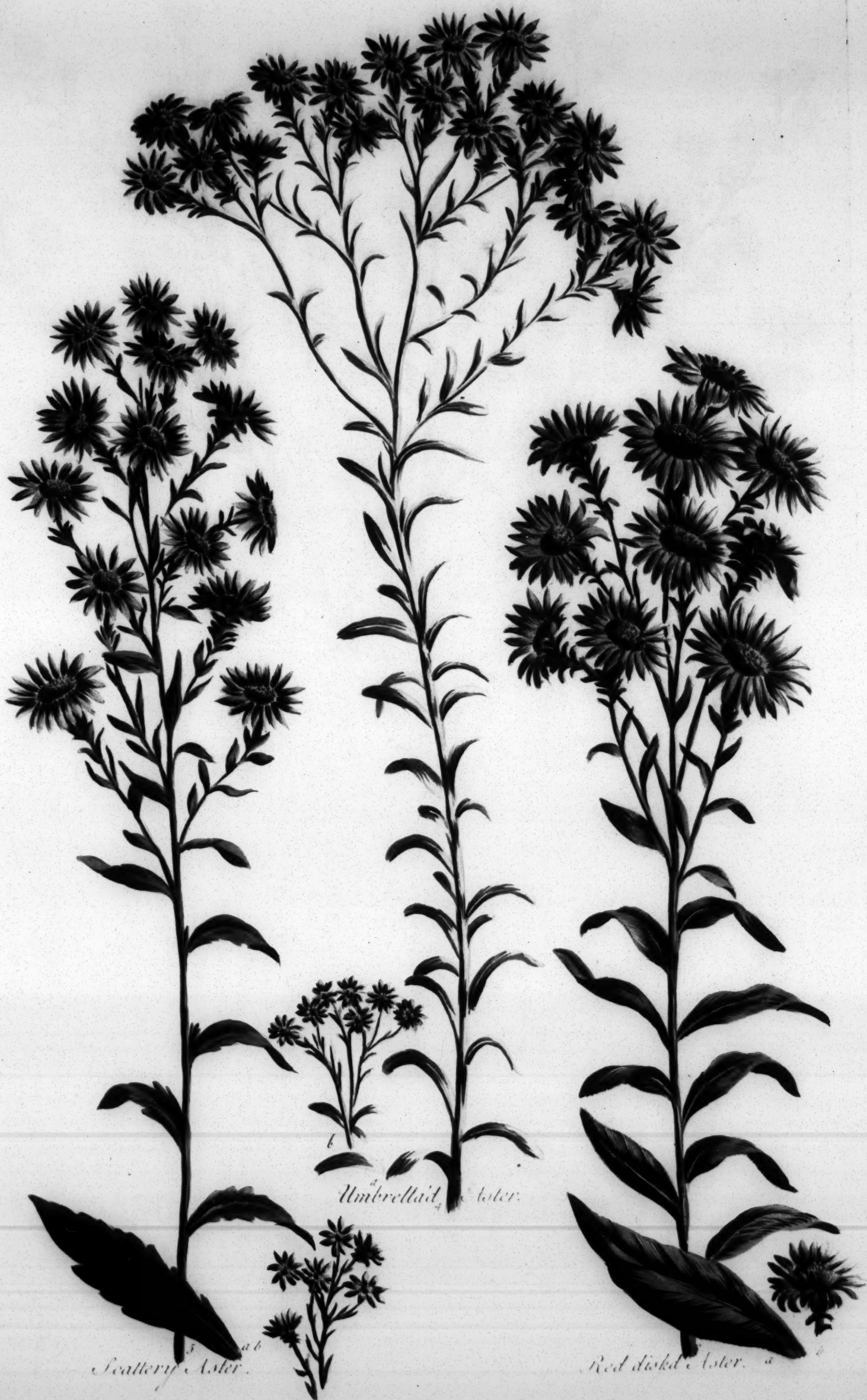
SPINEWORT.

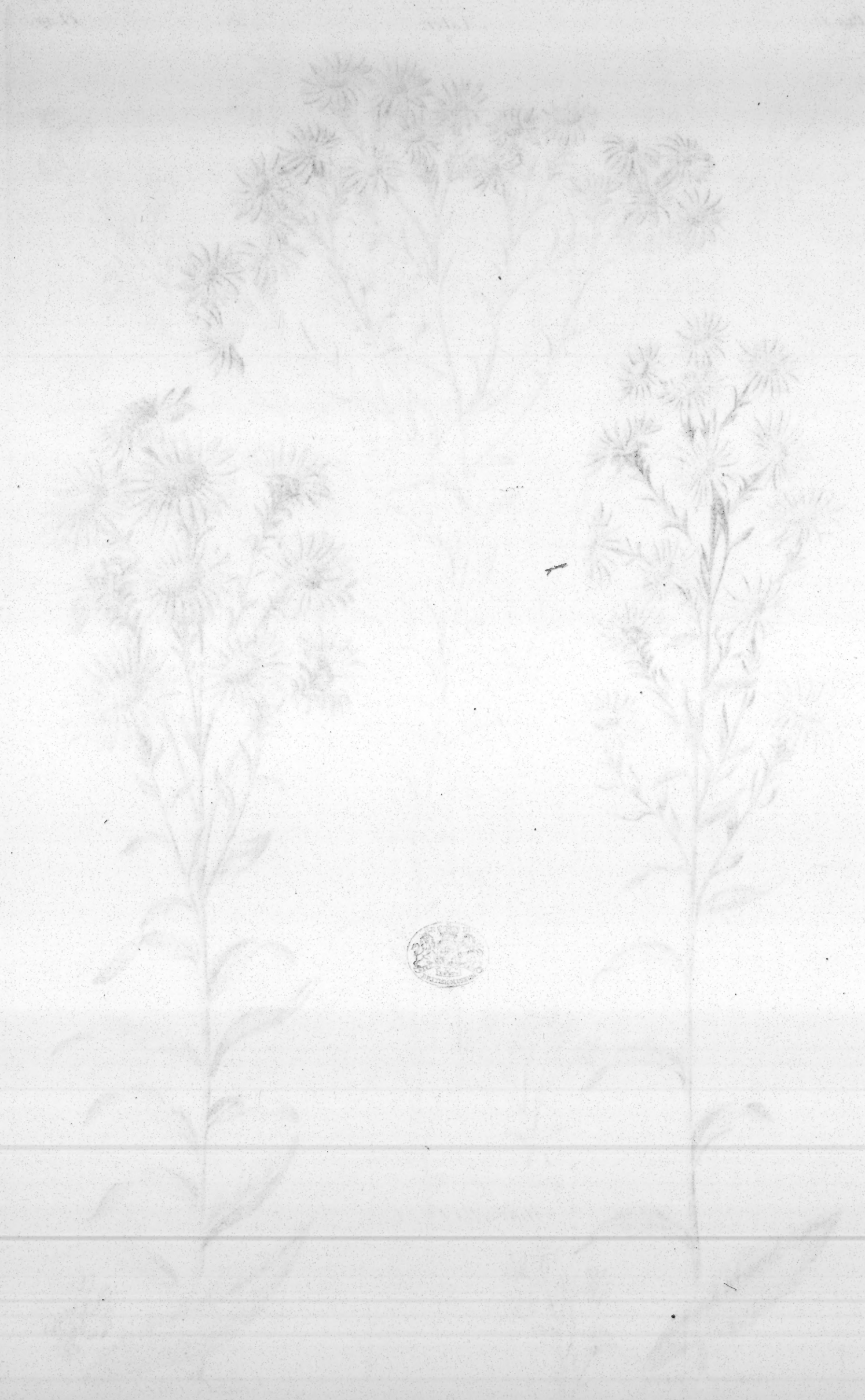




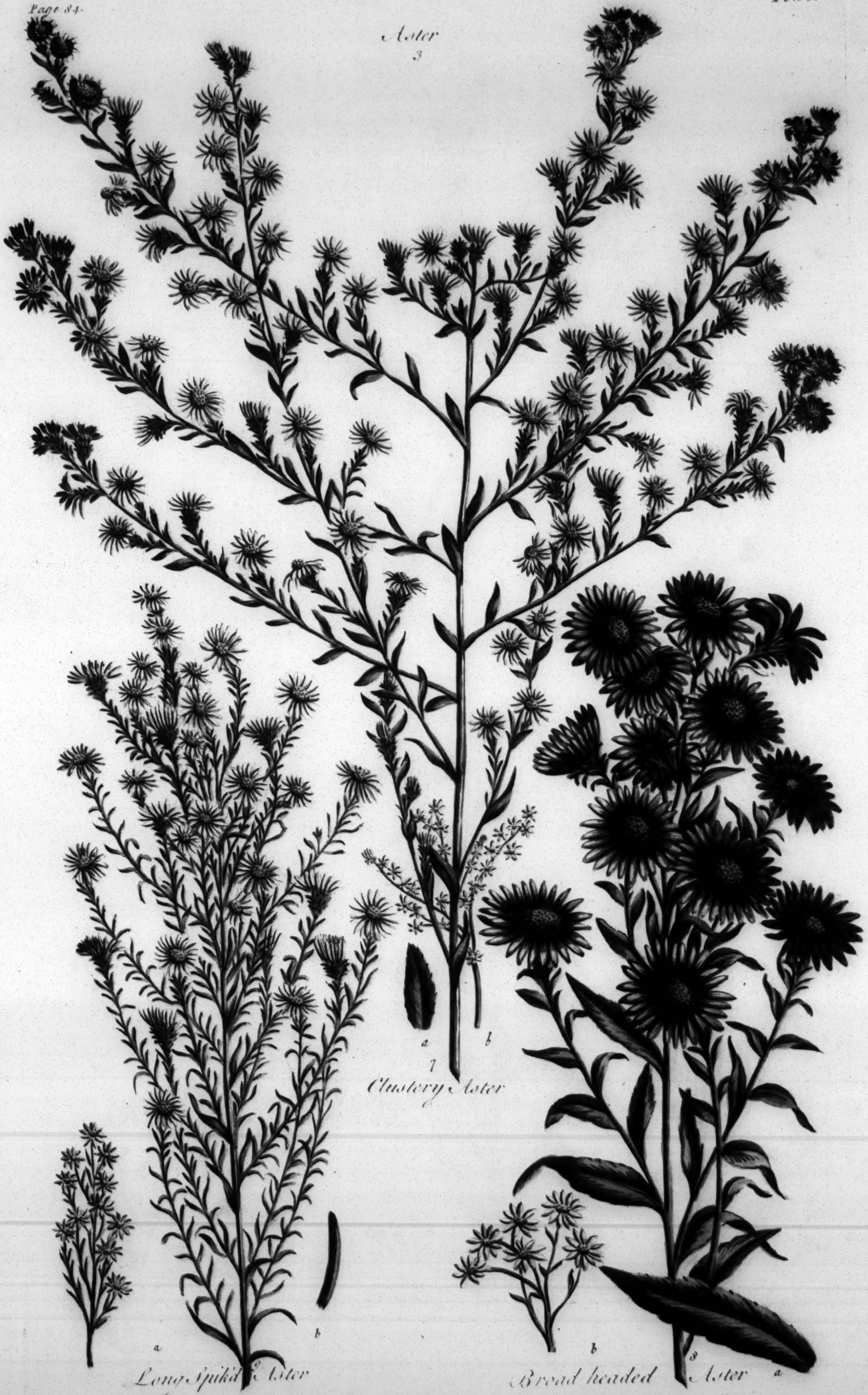






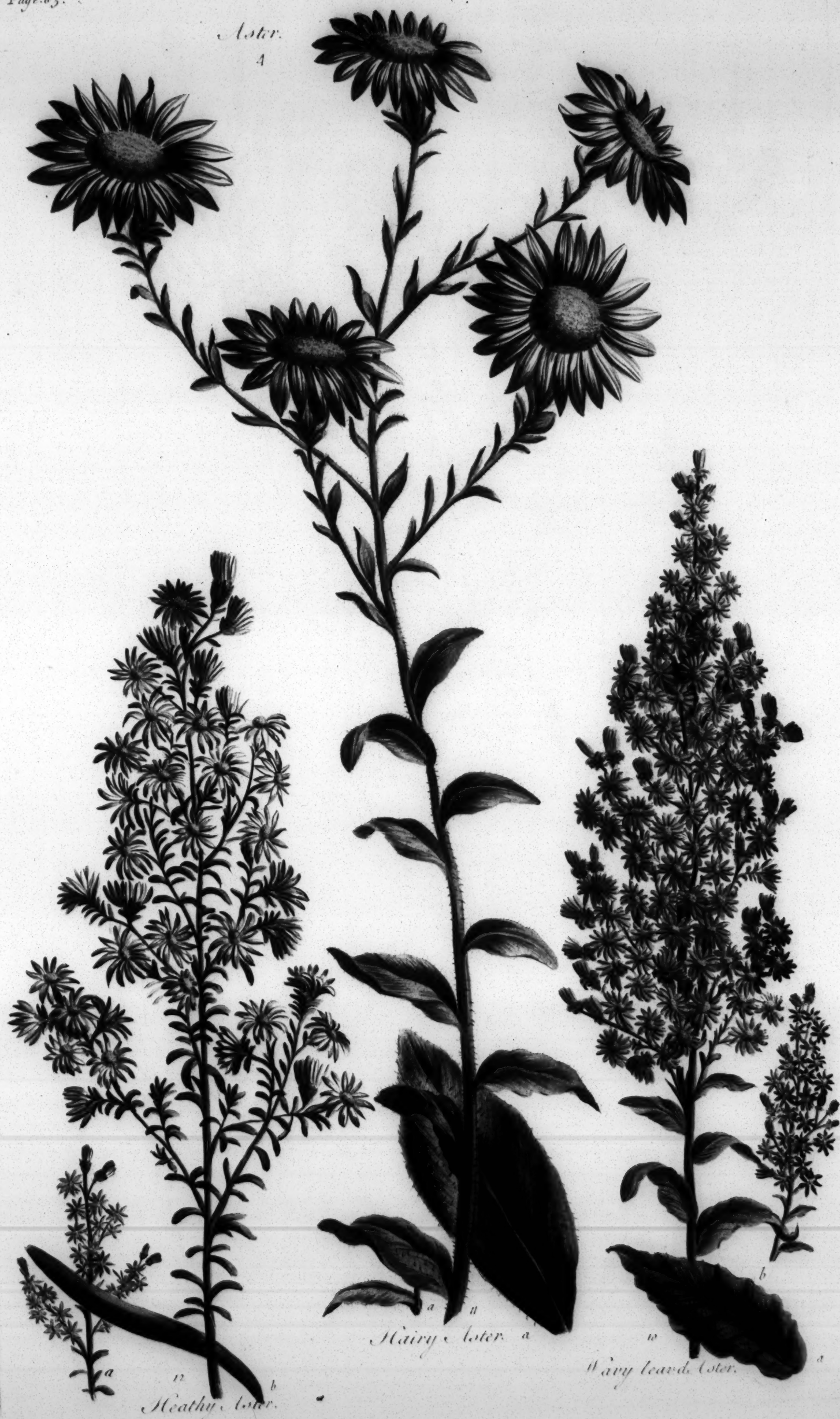


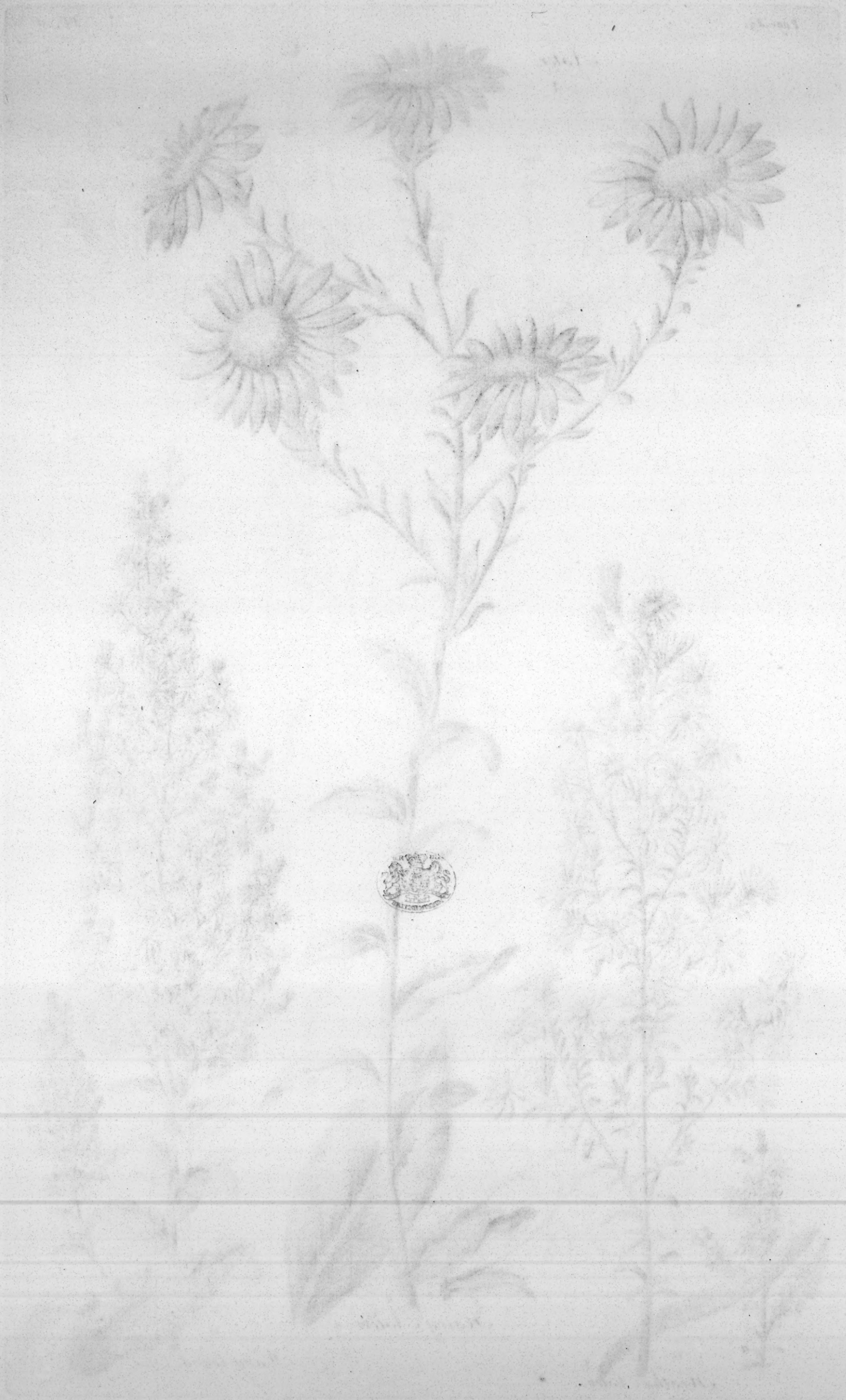
Aster
3



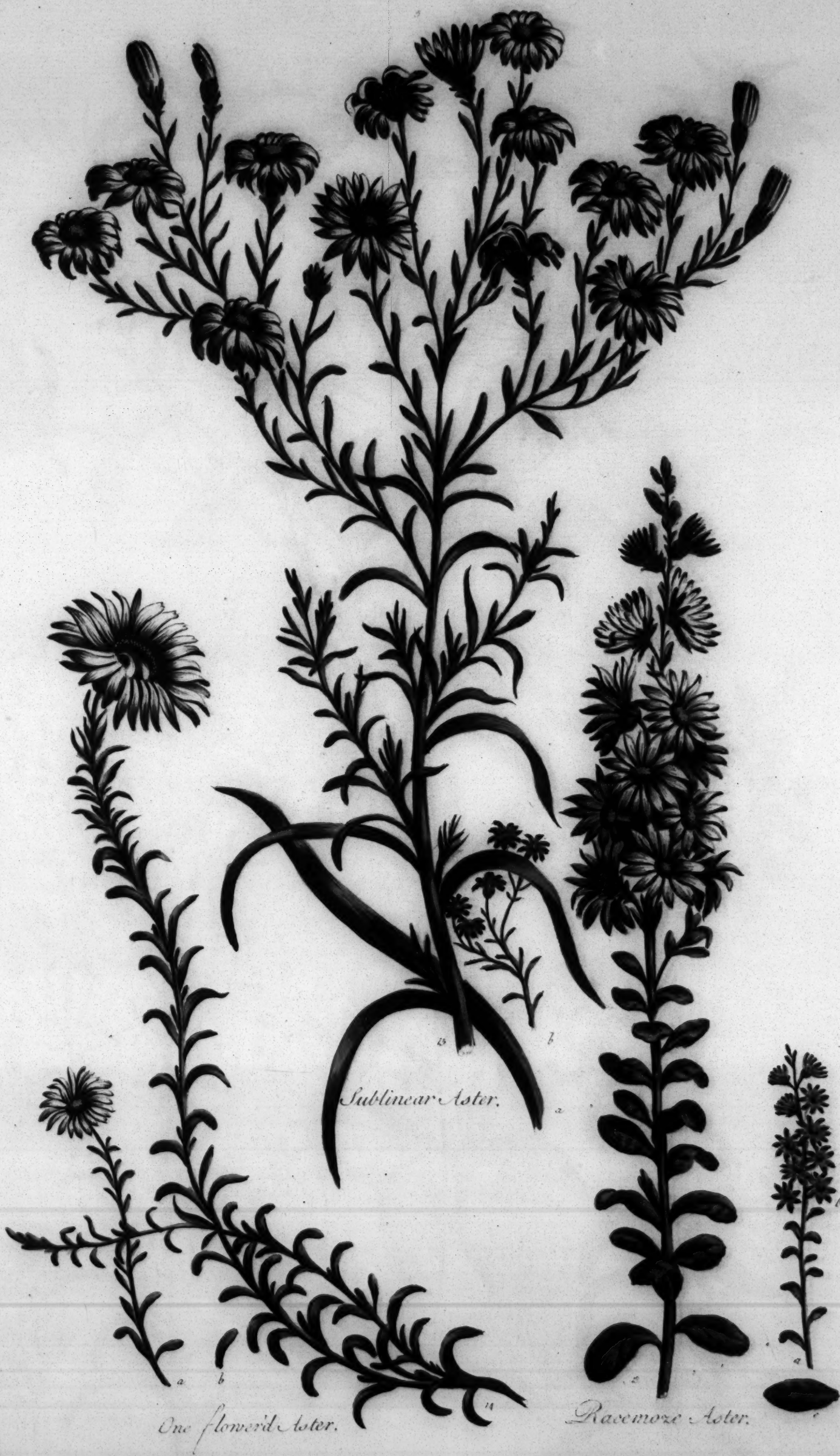


Aster.
4





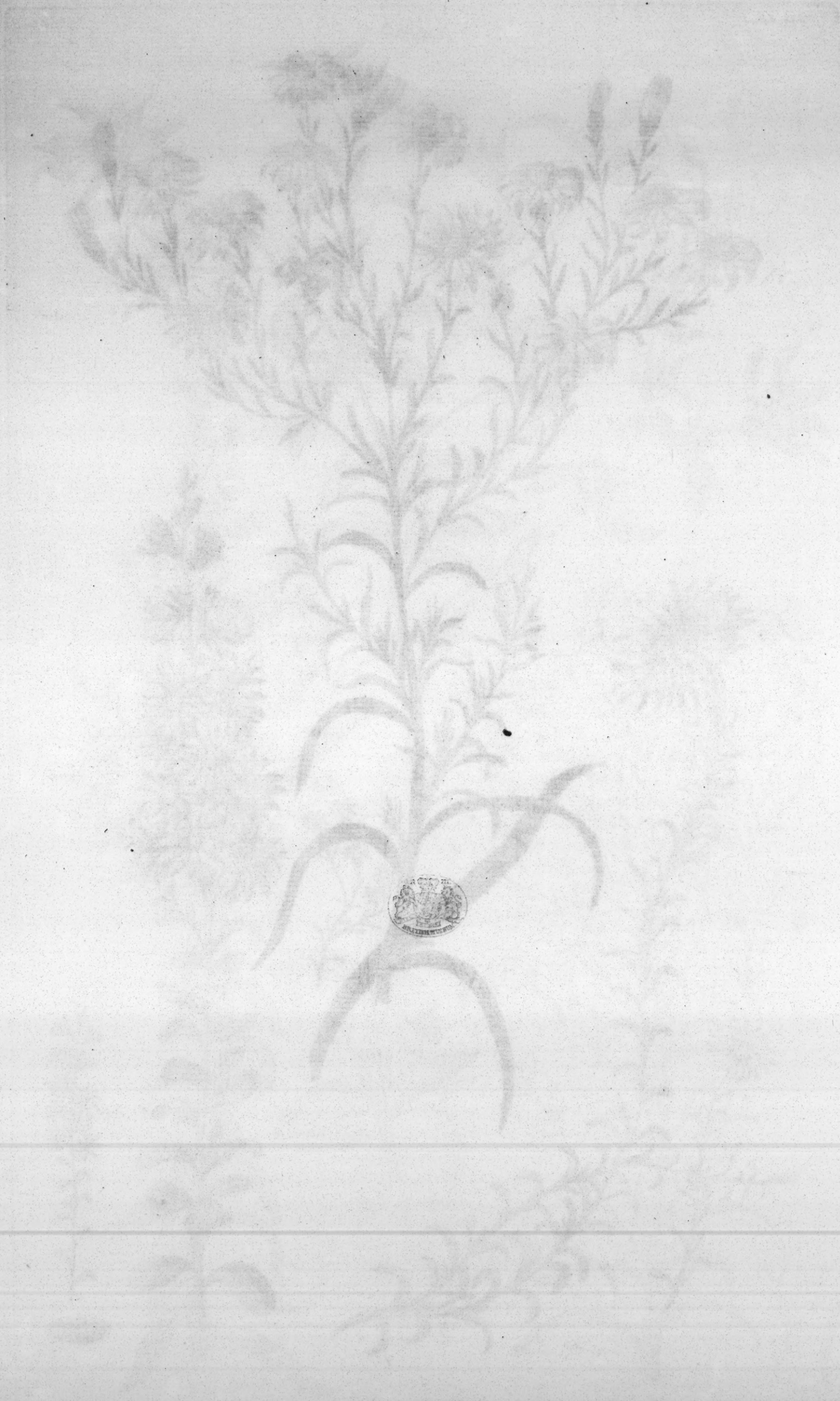
Aster



Sublinear Aster.

One flower'd Aster.

Racemose Aster.



Aster.
6





Aster

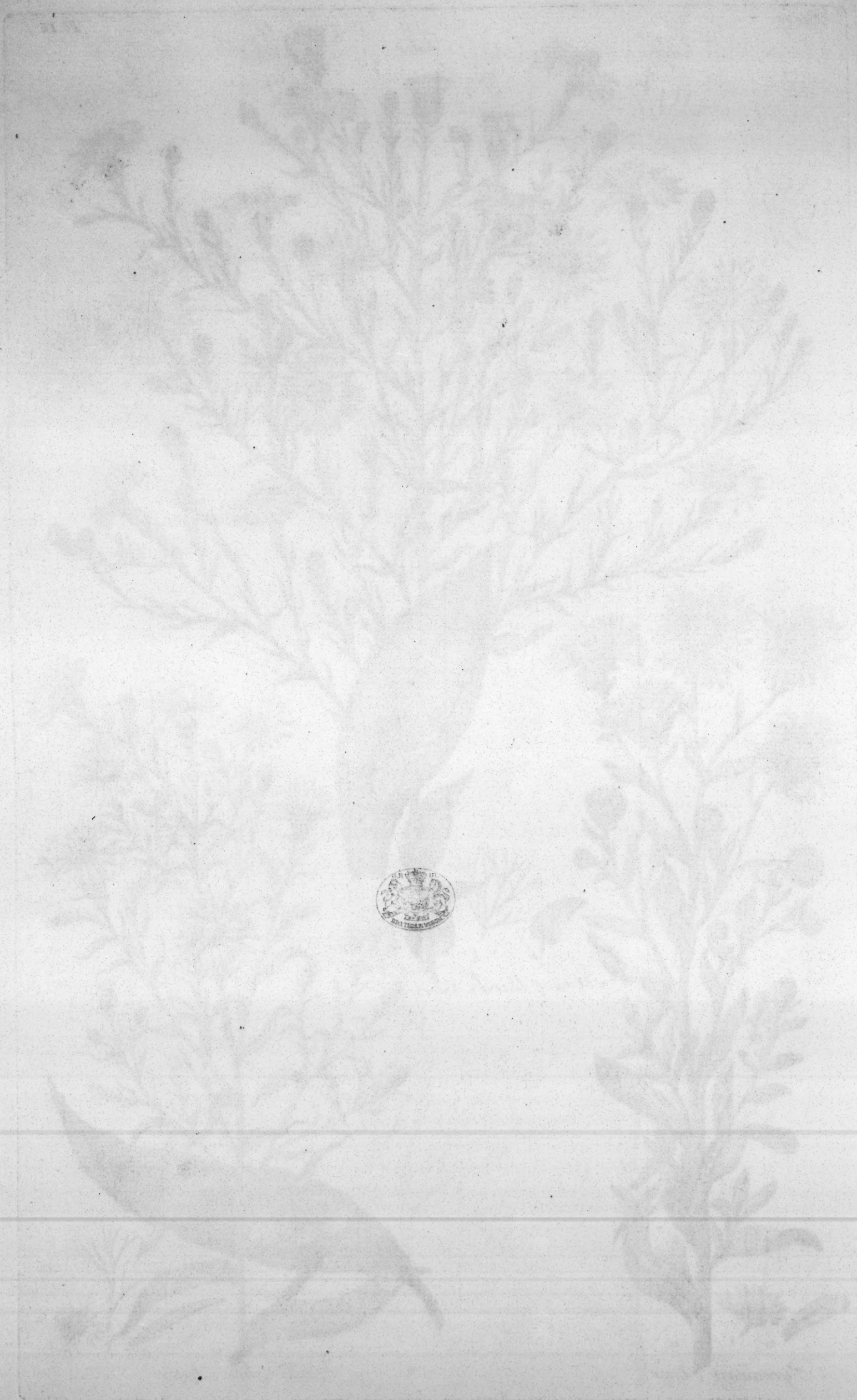
7



Heart leaved Aster

Pyrenaean Aster

Bushy Aster



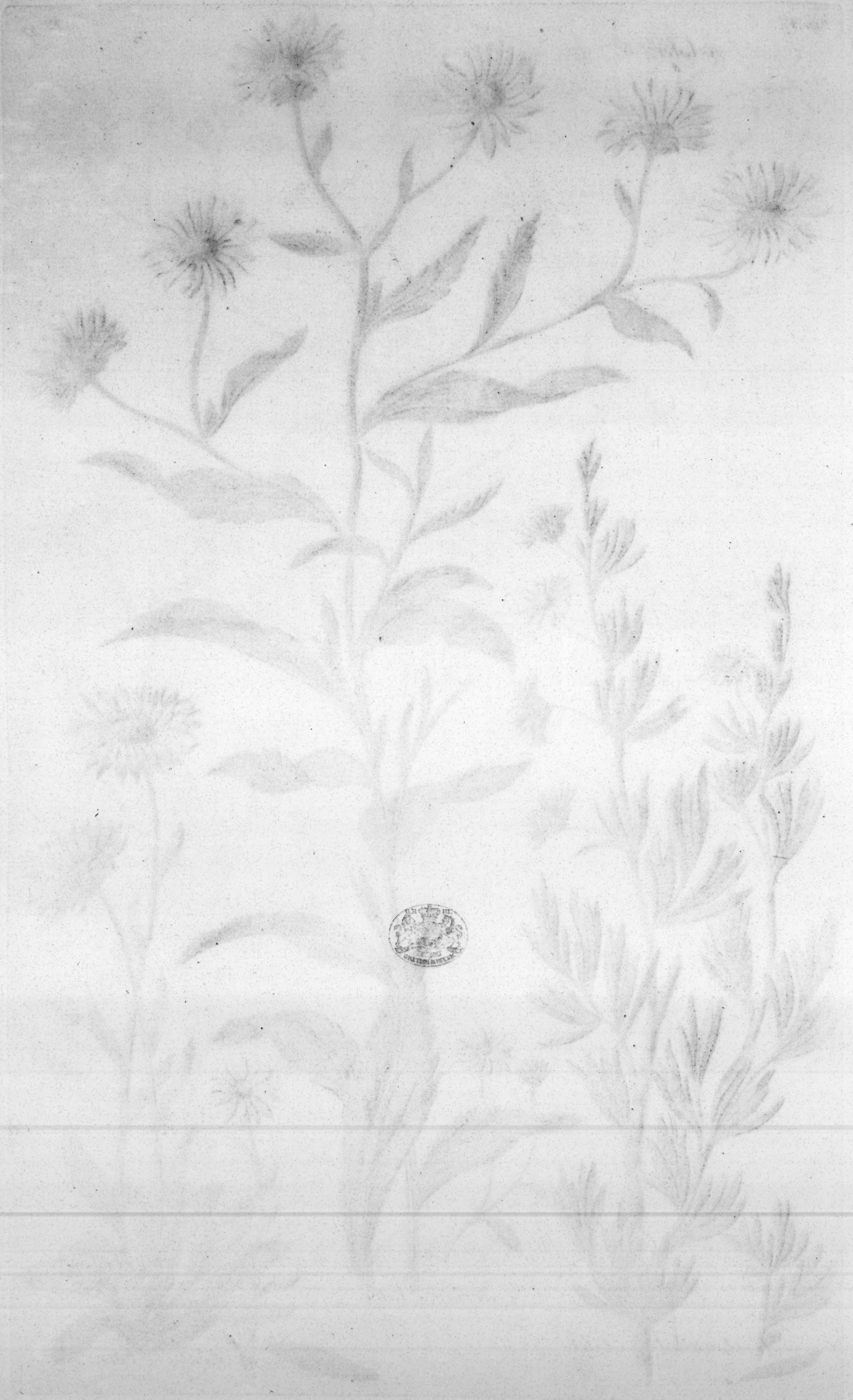
Aster.
8



Siberian Aster.

Dotted Aster.

Woolly Aster.

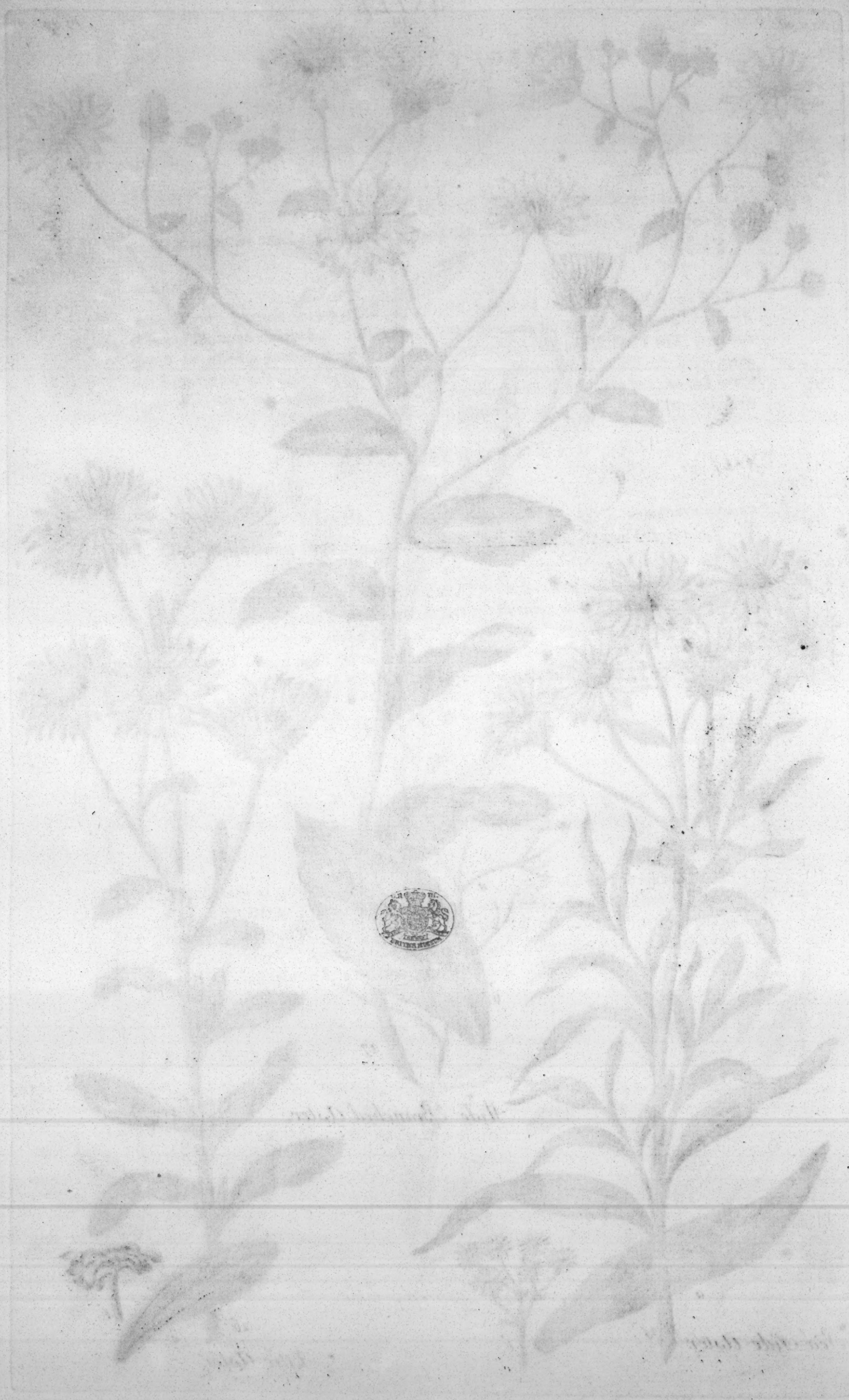




Sea Side Aster.

Wide Branched Aster.

Altic Aster.



Handwritten text, possibly a name or description, located below the plant illustration.

Handwritten text, possibly a name or description, located at the bottom right of the plant illustration.



28 *Crimson-stalked Aster.*

29 *Annual Lanceol. Aster.*

30 *Spring Aster.*





Pinnatifid Crown-seed.



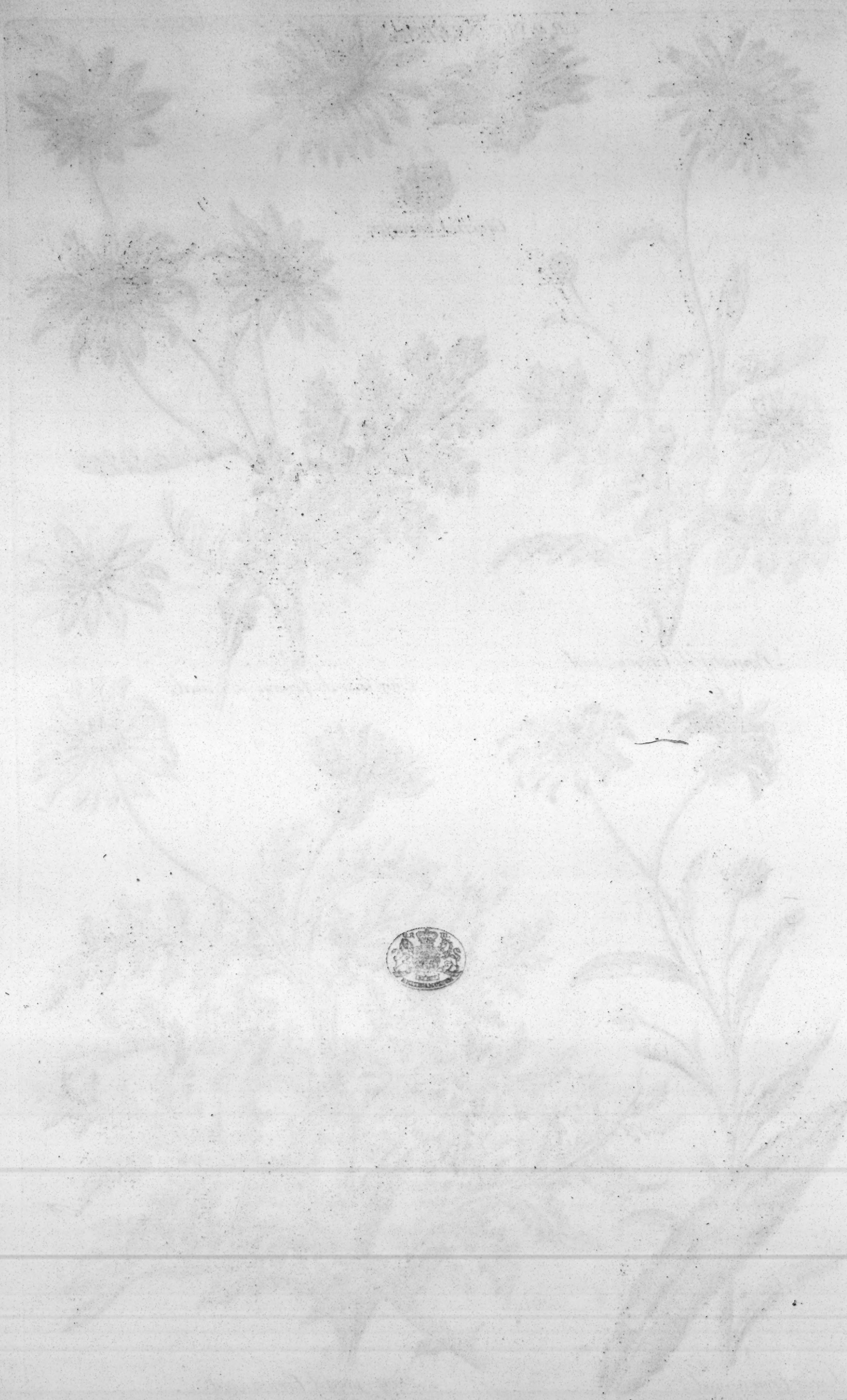
Egg-leaved Crown-seed.



Linear Crown-seed.



Long-jagged Crown-seed.











ETERNAL FLOWER.

Pl. 61.

Generic Character.



Spread-leaf'd Eternal Flower.



Pinnatifid Eternal Flower.



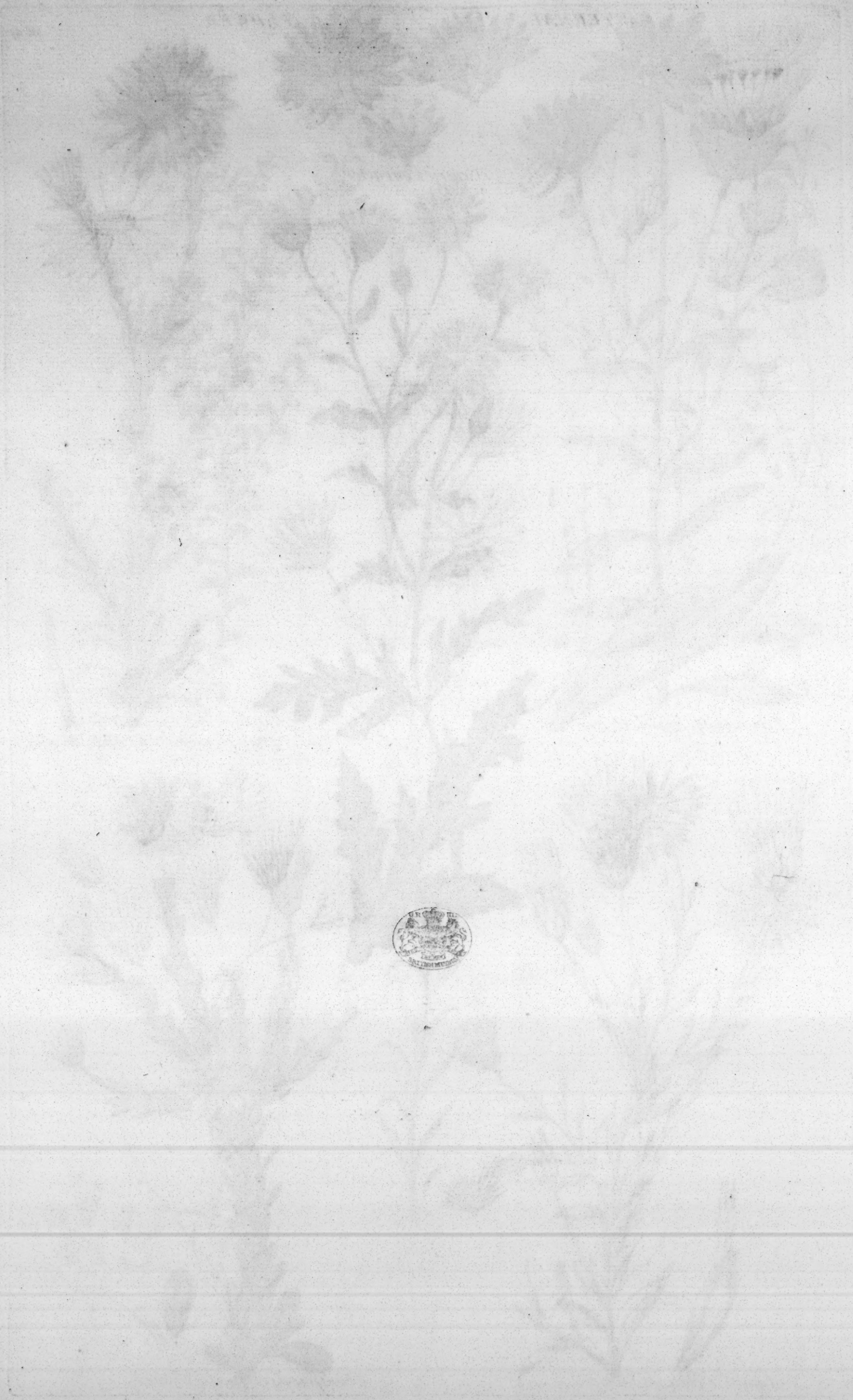
Few flower'd Eternal Flower.



Superb Eternal Flower.



Proliferous Eternal Flower.





Decumbent Eternal Flower.



Edg'd-leav'd Eternal Flower.



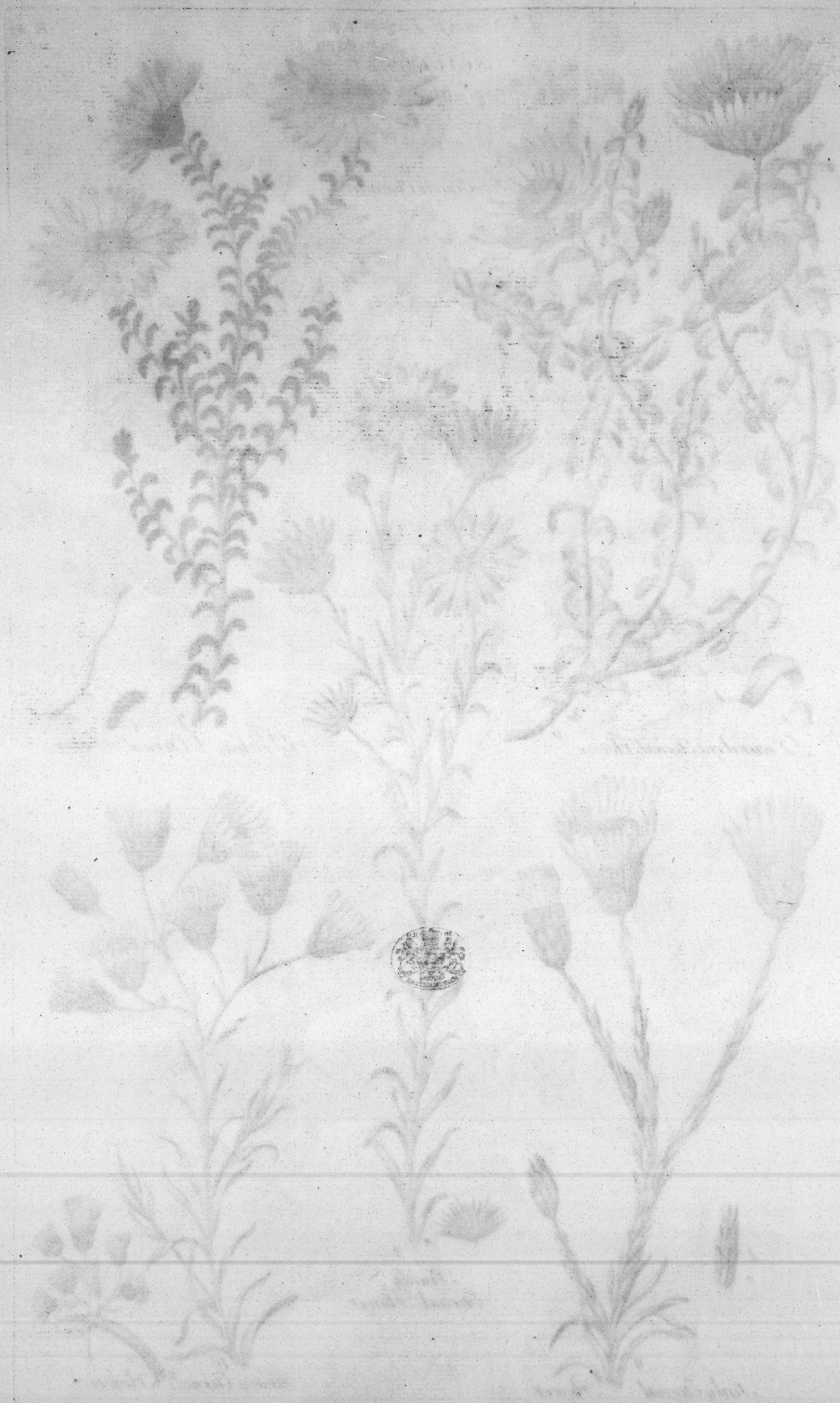
Scaly Eternal Flower.



*Prickly
Eternal Flower.*



Hoary Eternal Flower.



SCALEWORT.

Pl. 6.



Generic Character.



Golden Scalewort.



FEVERFEW.



Generic Character.



1
Ramote Feverfew.



2
Fleshy-leaved Feverfew.



4
Silvery Feverfew.



3
Fine-leaved Feverfew.



5
Fragrant Feverfew.





YARROW.

Generic Character



Twice-winged Yarrow.



Hairy Yellow Yarrow.



Pasture Yarrow.



Pinatifid Yarrow.

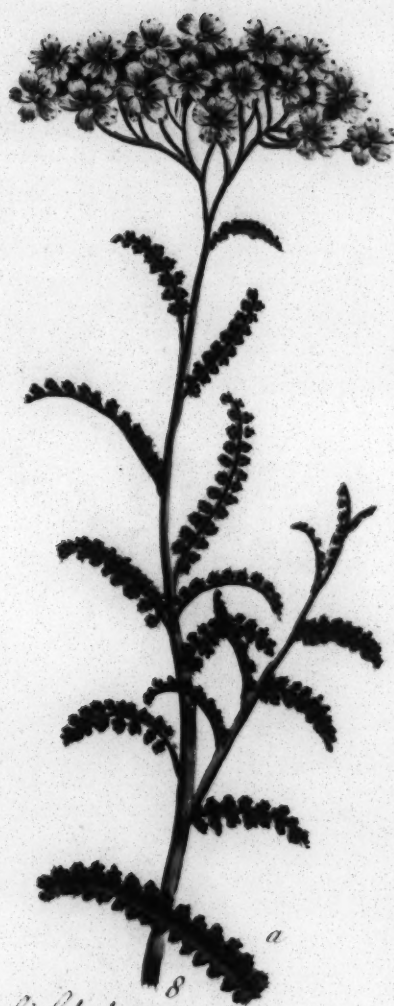


Open-leaved Yarrow.





7
Lanced Yarrow.



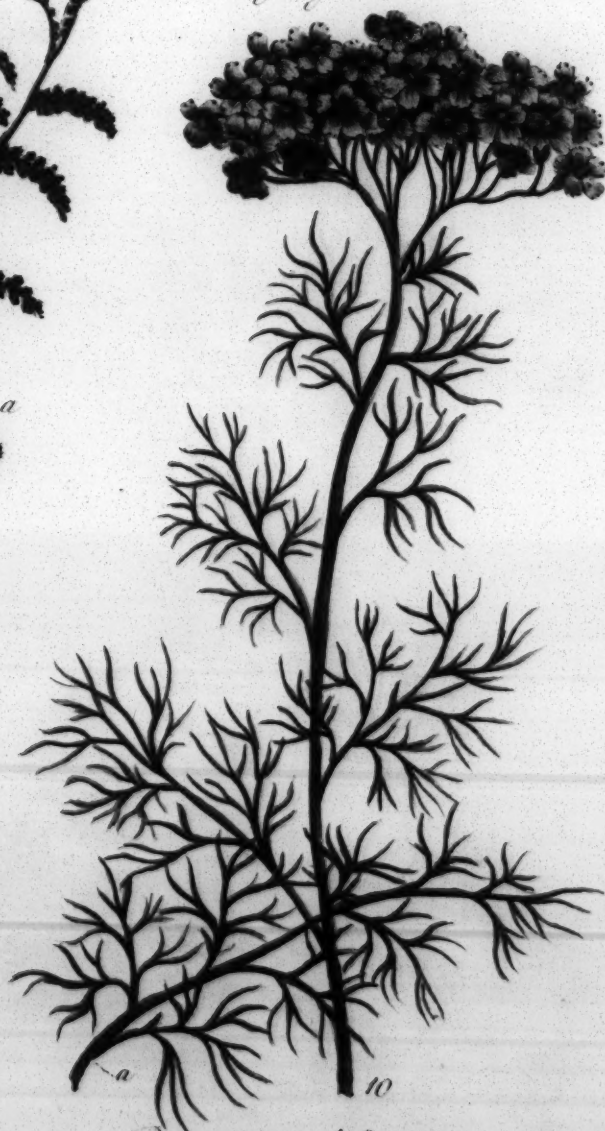
8
Sickled Yarrow.



6
Curly Yarrow.

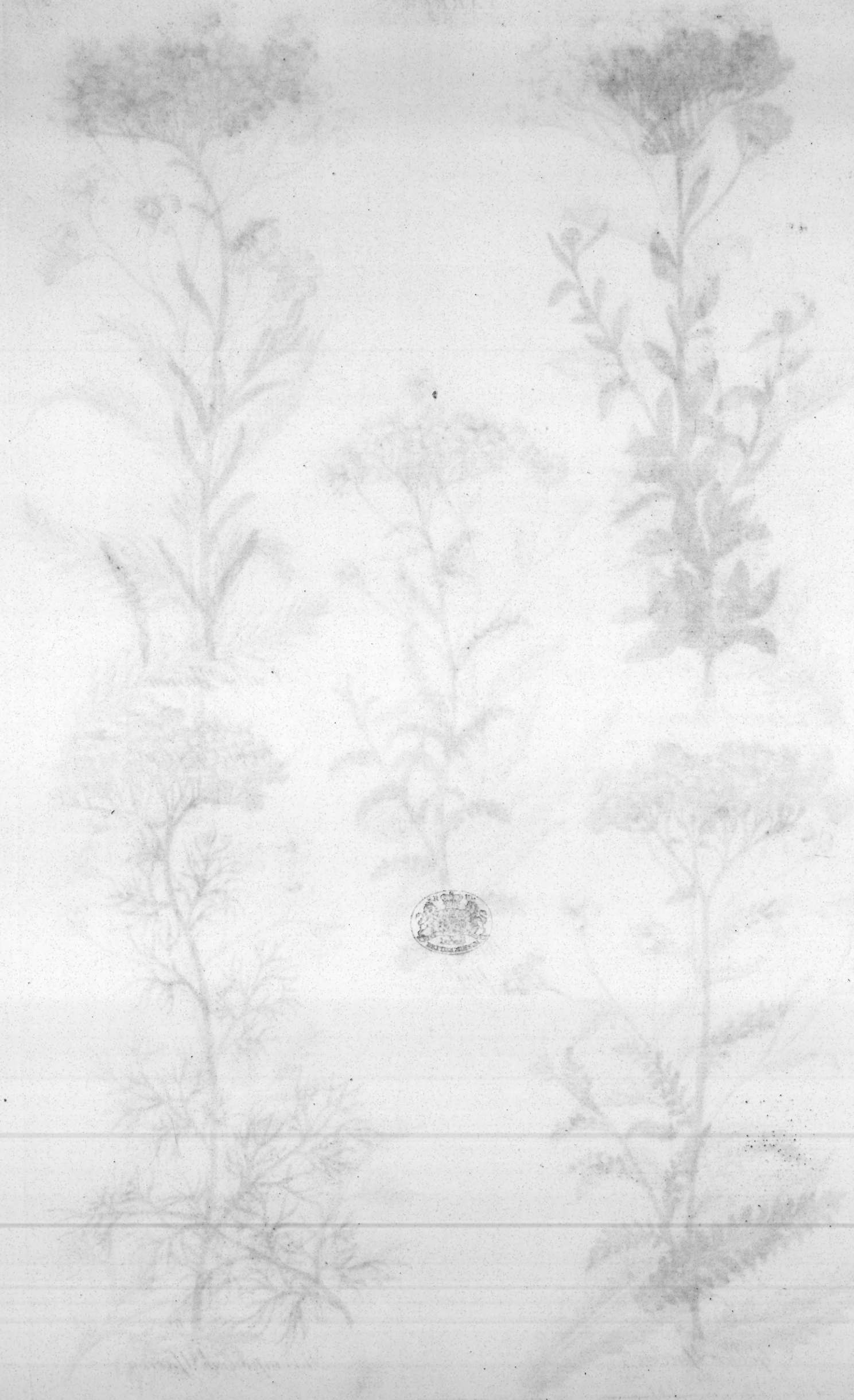


9
Golden Yarrow.



10
Recompound Yarrow.

1784





Irregular-leaved Yarrow.



Glossy Yarrow.



Sharp San'd Yarrow.



Doubly jagged Yarrow.



Pectinate Yarrow.



YARROW.

4



Dwarf Yarrow.

Woolly Yarrow.



Crested Yarrow.



Trifid Yarrow.



Generic Character.





2





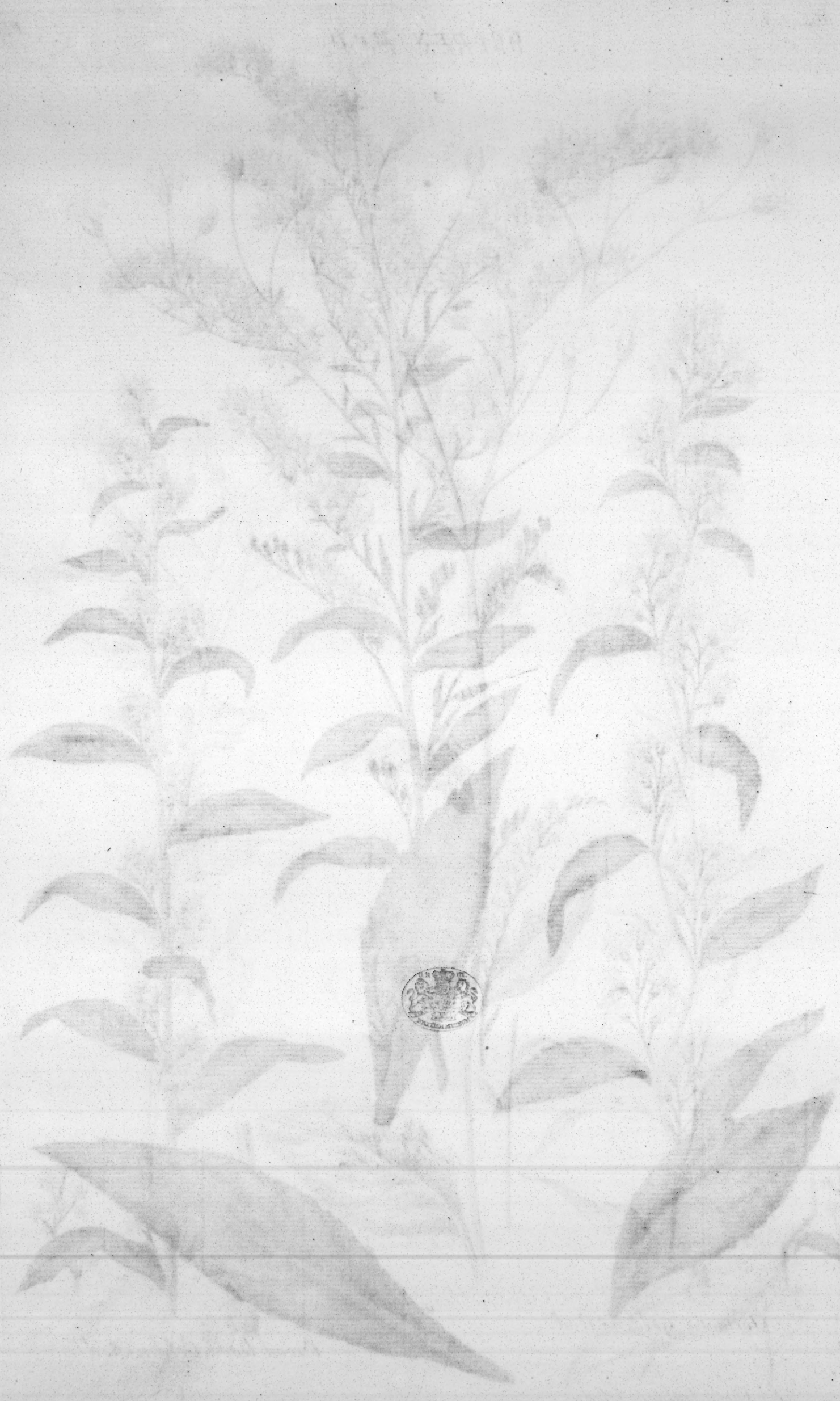
3



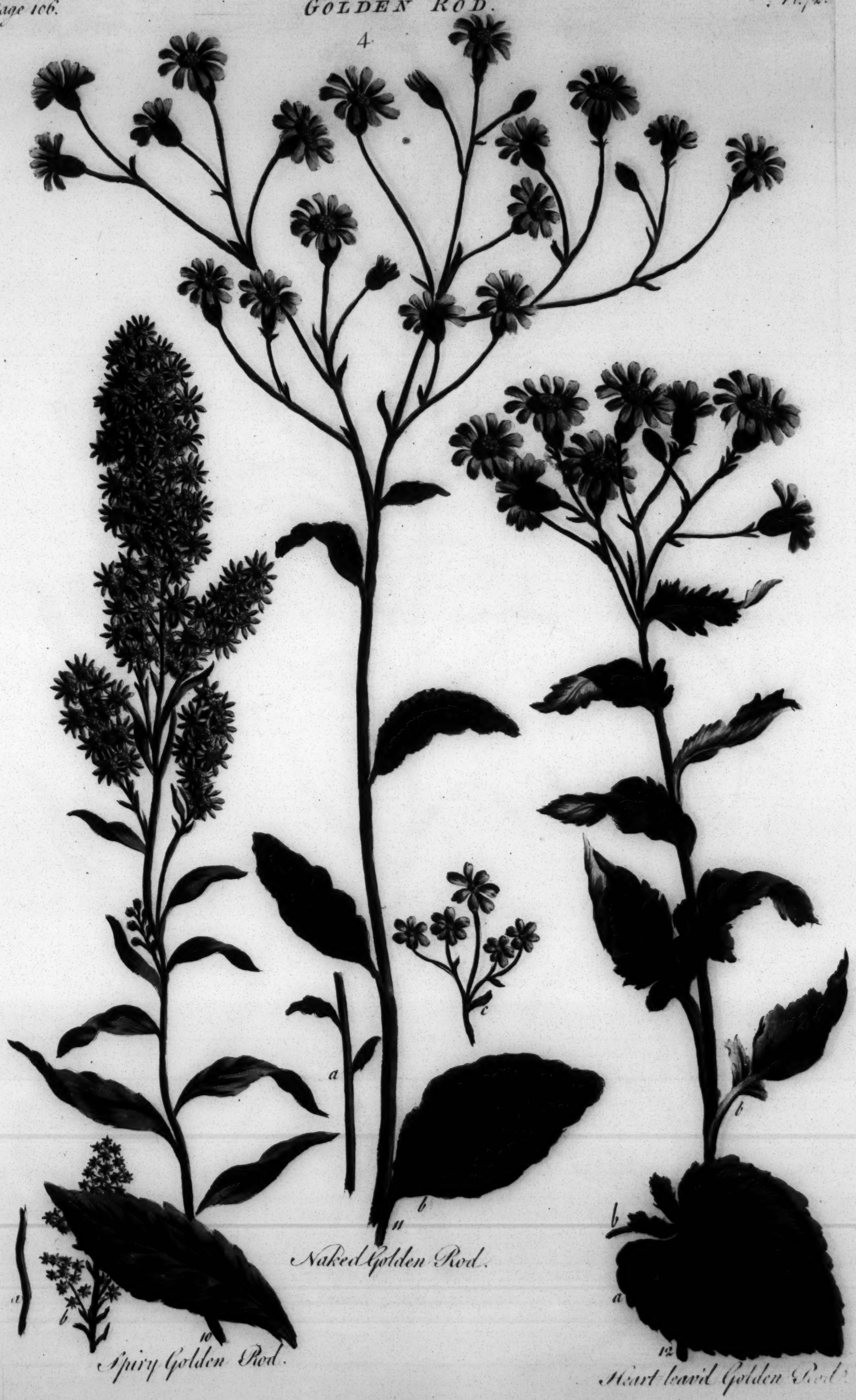
Glaucous
Golden Rod.

Tortuous Golden Rod.

Broad-leaved Golden Rod.



4.



Naked Golden Rod.

Spiry Golden Rod.

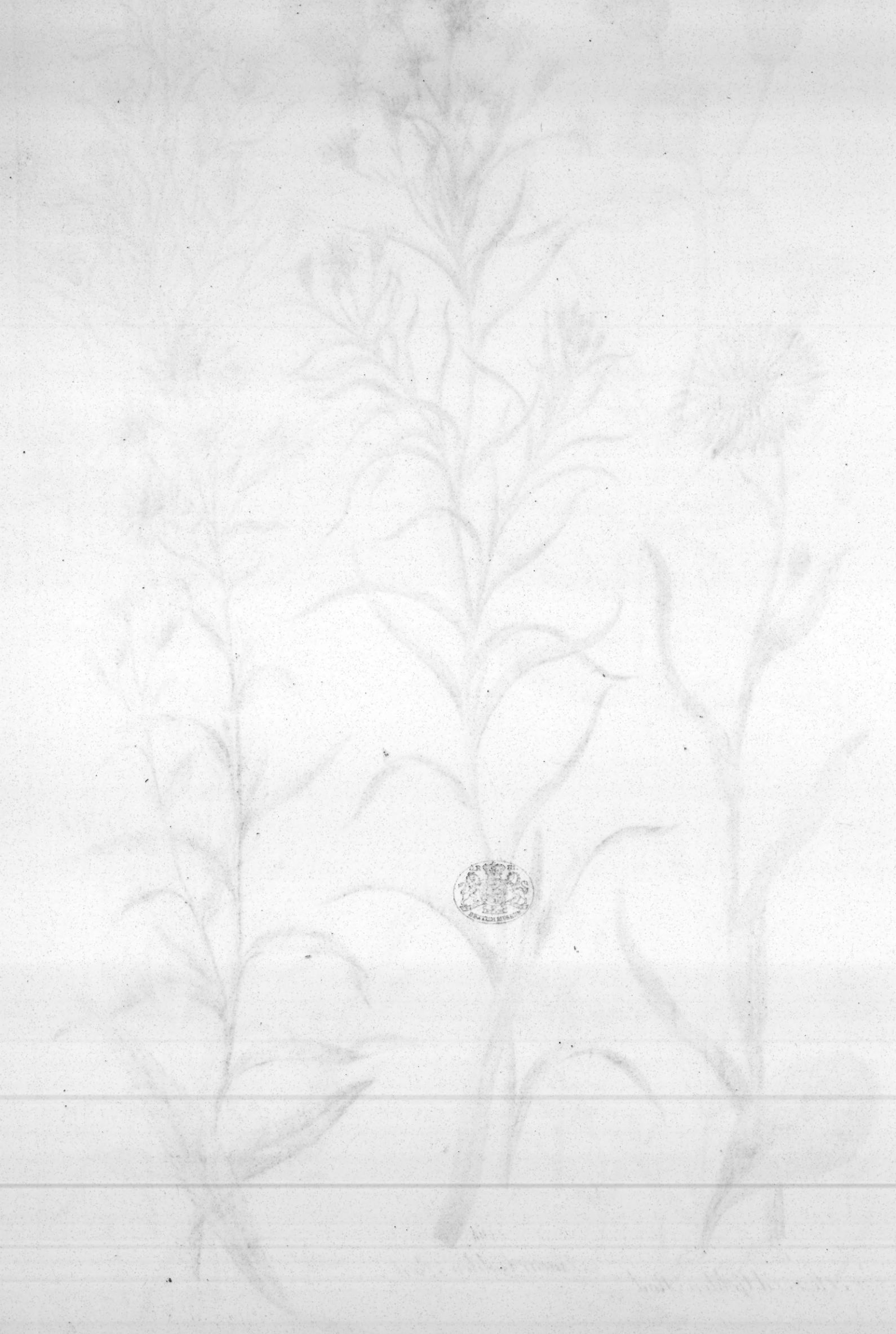
Heart leaved Golden Rod.





1840

1840



[Faint, illegible handwritten text at the bottom of the page]



Side Flowering Simson



Clustery Simson



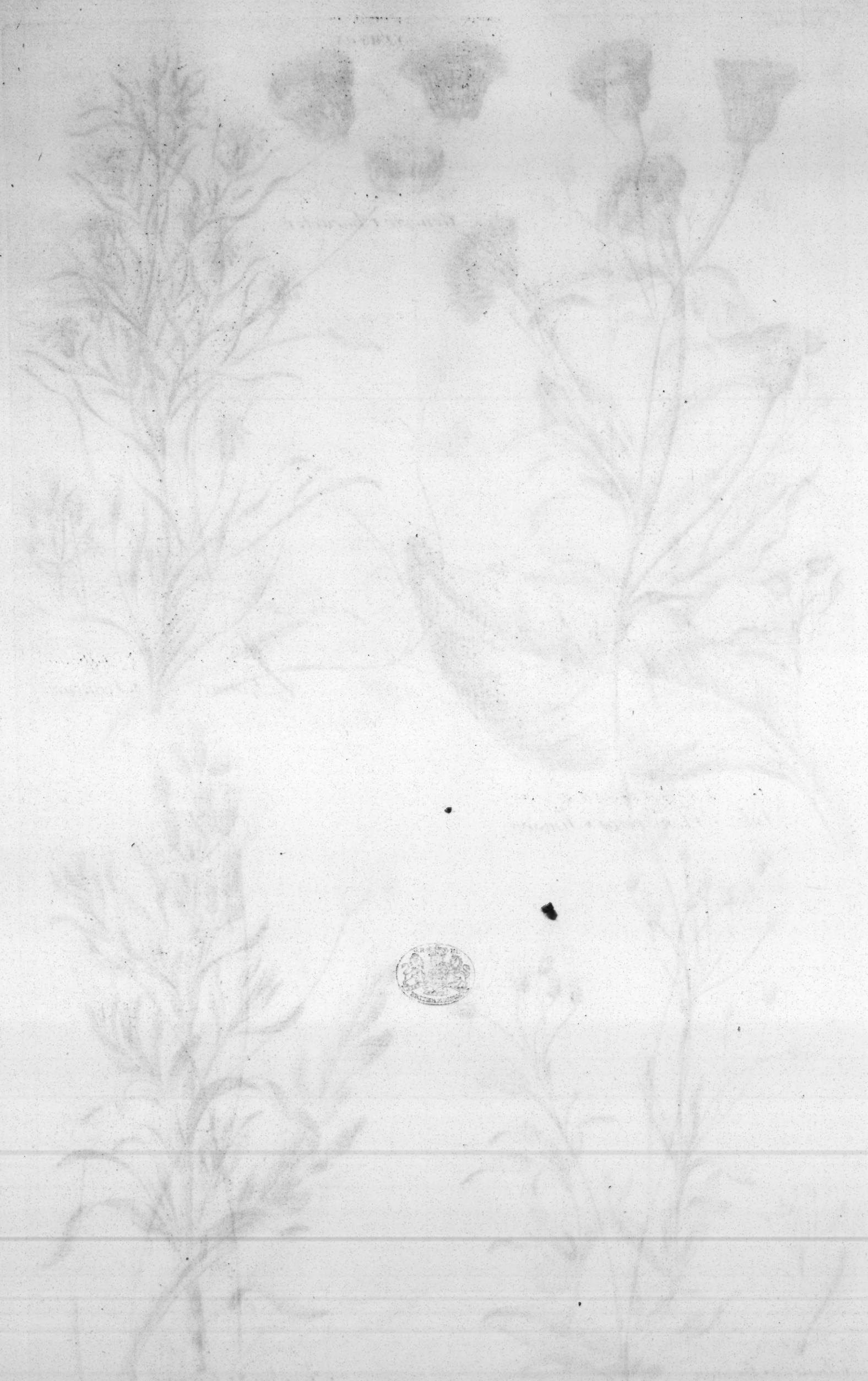
Generic Character.



Linear Simson



Revolute Simson

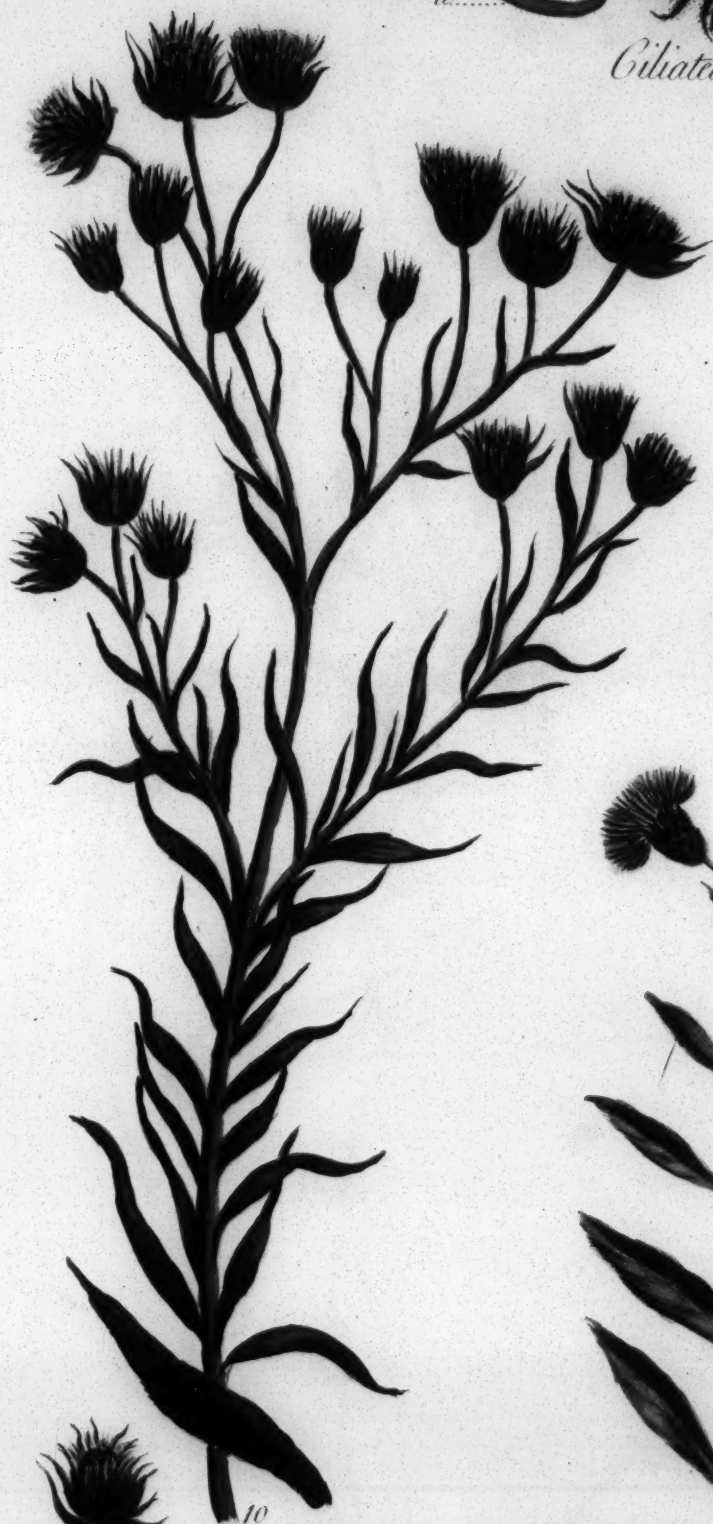




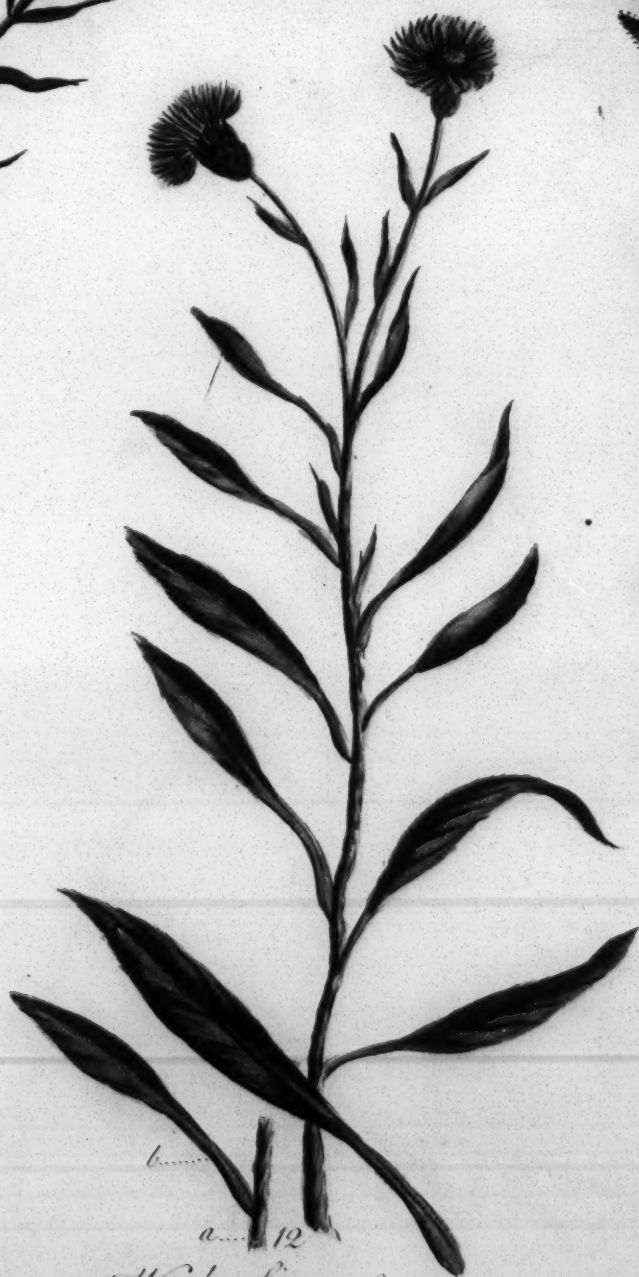




Ciliated Simson?



Golden Simson?



Woody Simson?



Edg'd Simson?





SAND-WEED.

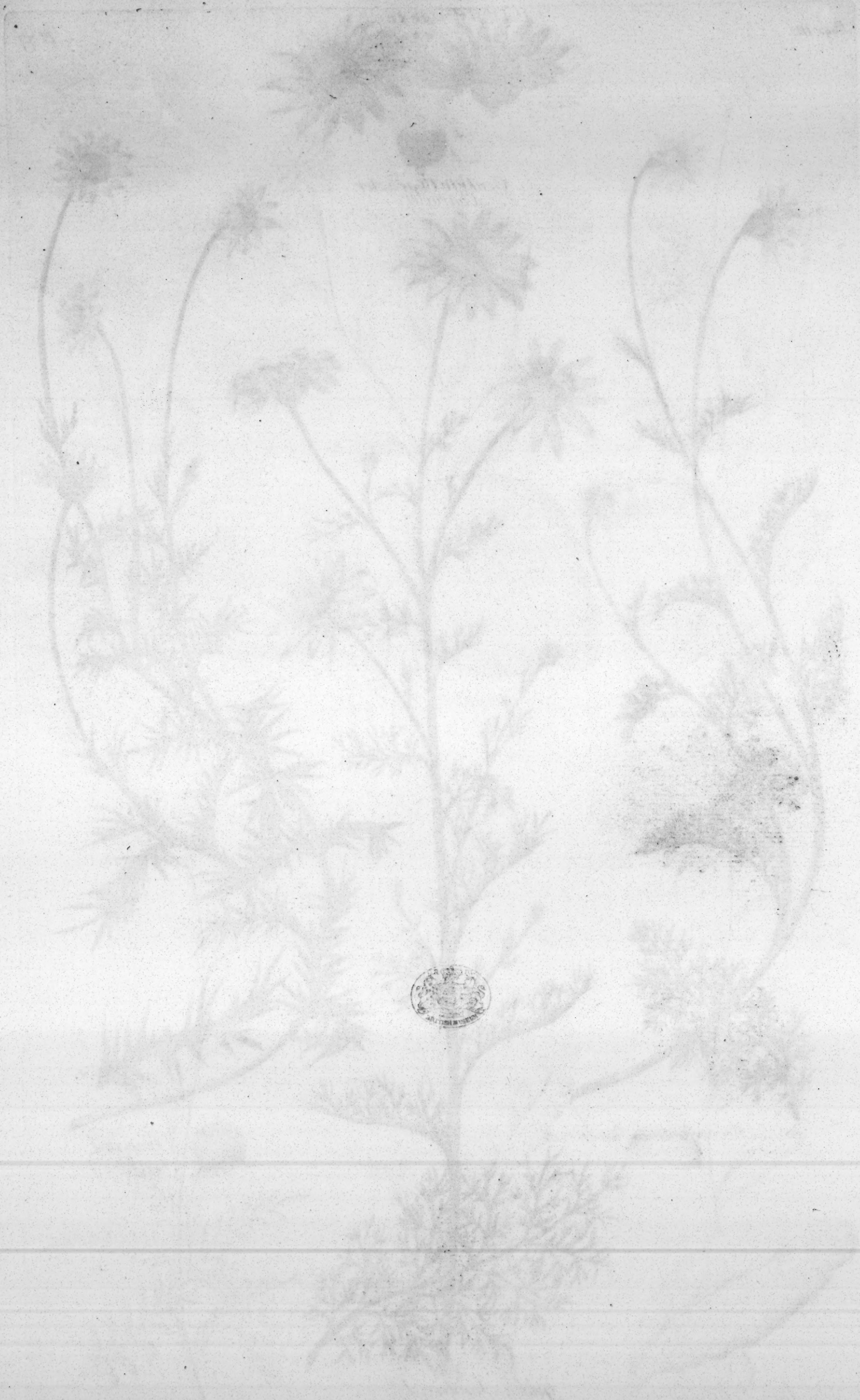
Generic Character.



Recompound Sandweed.

Pinnated Sandweed.

Golden Sandweed.







SCENTWORT.



Generic
Character.



Clustery-leaved
Scentwort.

SPHEREWORT.



Generic Character.



Matted Spheroxwort.



GUMM-THISTLE.

Fl. 61.



Woody Gumm Thistle.



Stalkless Gumm Thistle.



Leafyheaded Gumm Thistle.



Linear Gumm Thistle.



ROUGHWEED.



Scattery Roughweed?

LEAFWORT.



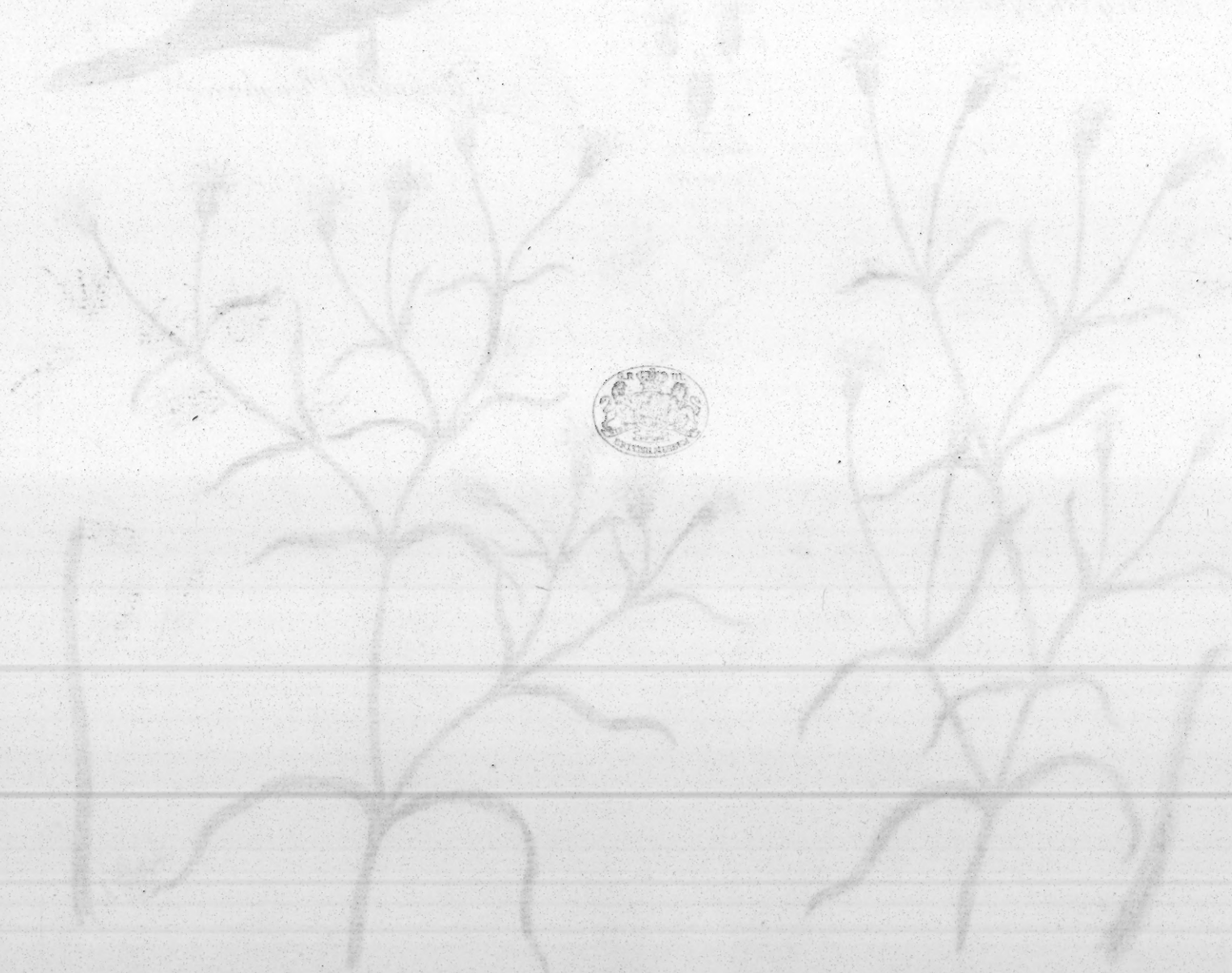
Umbrell'd Roughweed?



Edg'd Leafwort.



Naked Leafwort?





Headed White-weed.

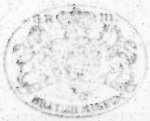
Side flower'd White-weed.

RED CUP.

Generic Character.



Large flower'd Red-cup.





Generic Character.



Pinnatifid Groundsell.



Amplexicaul Groundsell.



Lanc'd Groundsell.



Clammy Groundsell.



Ragged Cupid Groundsell.





Double-jagged Groundsel.



Blue-leaved Groundsel.



Long-footstalked Groundsel.



Crimson Groundsel.



Open-leaved Groundsel.



Hoary Groundsel.





12 a...
Woolly Groundsell.

14 a...
Twice-winged Groundsell.

13 a...
Multifid Groundsell.

15 a...
Ragwort Groundsell.

16 a...
Golden Groundsell.

17 a...
Sword-leaved Groundsell.

18 a...
Twice-serrated Groundsell.





Saracen Groundsell.



Slashy Groundsell.



Prickly Groundsell.



Rugged Groundsell.

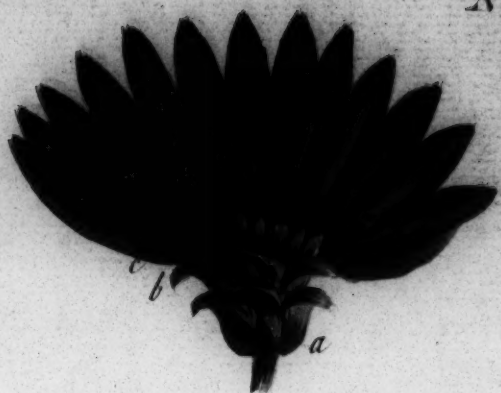


Brown'd Groundsell.



Water Groundsell.





Generic Character.



Chequerd
Noon Flower





